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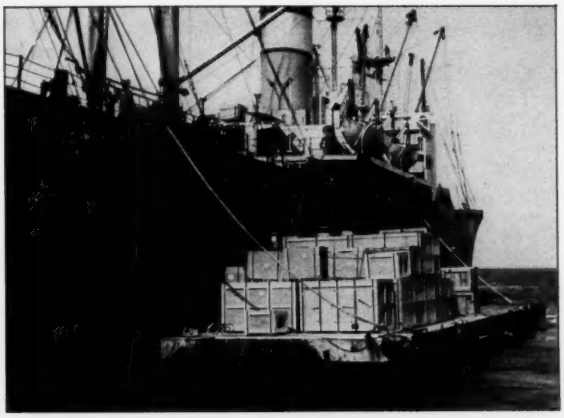
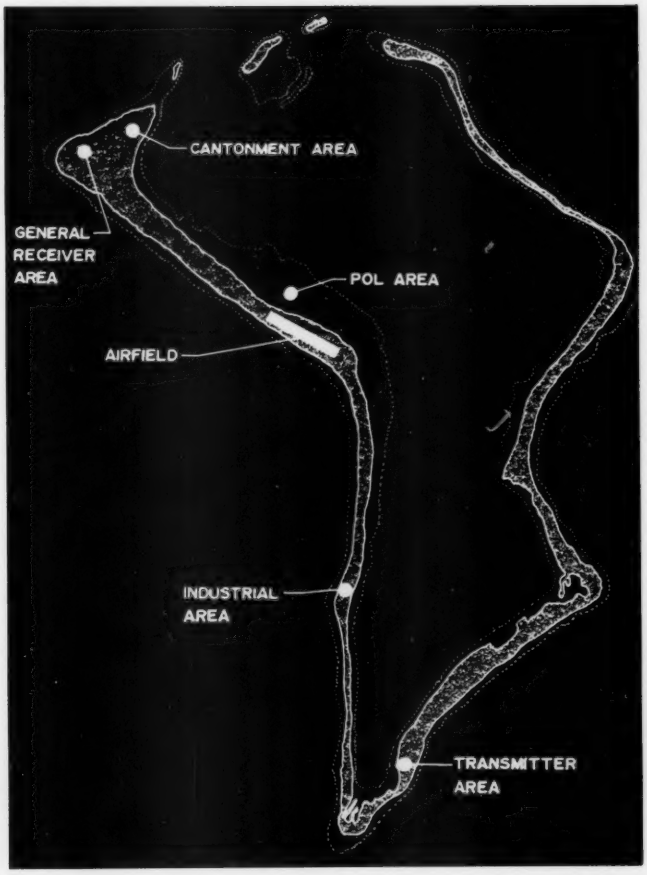
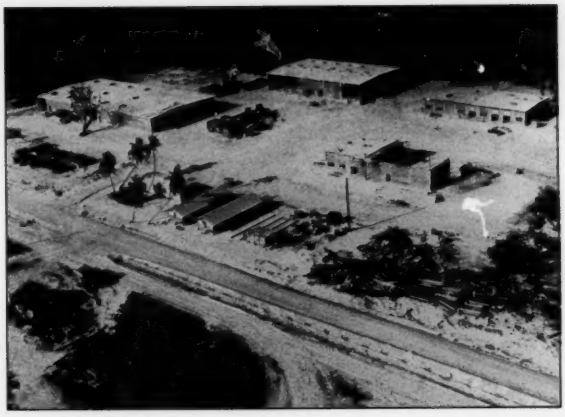
SPRING 1973







CHALLENGE OF DIEGO GARCIA

See Page 8

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WALTER M. ENGER
Rear Admiral, CEC, U.S. Navy
Chief of Civil Engineers
Commander, Naval Facilities
Engineering Command

A. R. MARSCHALL
Rear Admiral, CEC, USN
Deputy Chief of Civil Engineers
Vice-Commander, Naval Facilities
Engineering Command

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The Editor
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• Alexandria, Va.

NAVFAC and NCF Support Acoustic Test Range Construction In International Effort: PROJECT AFAR

BY ENS ROBERT H. MAYER,
CEC, USNR

In an effort to improve undersea acoustic communication, an eight nation task organization agreed to construct an acoustic test range in the Azores Archipelago. The participants included Canada, France, Germany, Italy, The Netherlands, Portugal, United Kingdom and the United States.

The initial concept of the range was to mount one transmitting array and two receiving arrays atop individual seamounts off the west coast of Santa Maria Island. This site was chosen because of the area's unique bottom topography and winter storm conditions which would offer a desirable set of circumstances well-suited for acoustic experimentation and not available in continental shelf testing.

Additional facilities were to include a subsurface oceanographic buoy for continuous measurement of sea parameters, and a shore station consisting of a laboratory and power plant to monitor range experiments.

The United States Navy was vested with the overall management responsibility of Project AFAR (Azores Fixed Acoustic Range). This responsibility included the identification and coordination of the material, service, and financial support of each of the participating nations. As part of the total U.S. contribution, the Naval Facilities Engineering Command and the Naval Construction Force were charged in 1970 to provide the engineering support and construction services necessary to install and immobilize four inshore cables through the surf zone of an isolated bay of Santa Maria and up the adjacent 500-foot slope, which terminated in a cliff.

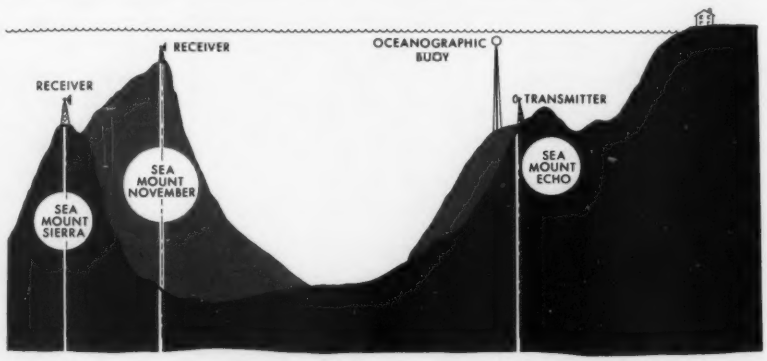
As developed, this inshore cable task consisted of preparing a suitable route through the surf zone and up the slope to a terminal vault installed atop the cliff; laying the four double-armored coaxial cables from the cable tanks of the Italian cable ship *Salerum* and the British cable ship *Bullfinch;* encasing each cable with split pipe armor protectors to a depth of 60 feet, and pinning the encased cables to the rock bottom at specified points along the cable route. The work was to be accomplished within the weather window of 1 June through 30 August; otherwise weather and sea conditions were not likely to be compatible with the planned surf zone operations.

A predeployment diver's survey revealed a seafloor of basalt marked by rugged rock outcroppings and wide, vertical-walled ravines running transverse to the proposed cable path. It was obvious that the numerous obstacles and steep slopes would have to be removed to prevent undesirable long cable suspensions. Utilizing hand-held and track-driven crawler pneumatic drills, Seabee divers drilled and packed the necessary dynamite holes with charges and placed additional plastic explosives where required.

Following the initial detonations and while additional Seabees prepared the cable track on shore, underwater demolition hose charges were strung over the length of cable route to clear blasted rubble from the prepared trench.

The first two cables were laid from the *Salernum* which held position 3000 feet offshore using a combination of anchoring, ship's power and tug assistance. Each cable was hauled ashore by two crawler tractors traversing the top of the cliff with grapnel lines connected to the cable's shore end. To prevent cable contact with the seafloor during the inhaul operations, ship's personnel attached flotation balloons to the cable as it left the *Salernum's* bow.

Once the cable had been hauled to a prescribed position beyond the terminal vault and attached to a deadman



Cross sectional view of Fixed Acoustic Range

anchor on the beach, divers swam the cable from the shore seaward, cutting loose the floats and, thereby, depositing the cable on the seafloor along the prepared path.

In and near the surf zone, cables are likely to experience their greatest hydrodynamic force loadings and must be protected and stabilized to reduce possible damage from chaffing and pounding surf. In locations where the seafloor consists essentially of hard rock, preventing cables from being buried beneath protective sediments, a common practice is to encase the cables within modular sections of cast iron split pipe. Such was the case at Santa Maria.

Applying an analytic method developed by Lt. Robert T. Hudspeth of NAVFAC, it was determined that each cable would require 1500 feet (to a depth of 60 feet) of these split pipe protectors to minimize the damaging effects of a maximum 40-foot winter surf.

The commercial technique of split pipe application was to stage the heavy three foot sections underwater along the cable track and later to bolt them in place section by section. However, this method was determined to be too lengthy a process to complete the four cable application before the close of the weather window and an innovated technique was substituted.

Split pipe was applied to the cable in 30 foot lengths on shore and towed by a motorized causeway pontoon along the entrenched cable to where it could be diver-connected to the previously applied sections. This process was repeated until the required 1500 feet of cable had been encased.

Tug assisted in-haul of cables from the cable tanks in the ships to the beach. Crawler tractors atop cliff on shore pulled cable to antenna sites.

Divers used hand-held and tracked crawler pneumatic drills to drill dynamite holes for blasting out obstacles and leveling steep slopes along cable path. They also drilled holes in the rocky floor for placing U-bolt anchors to prevent cable motion and possible fatigue failure.

Although two weeks were required for encasing each of the first two cables, this method saved nearly one month over the time estimated for commercial application. Adequate clearance did not exist between the remaining two larger diameter cables and split pipe, however, and this improved encasement technique could not be utilized.

A second innovation was prepared in time for the arrival of the *Bullfinch*. A standard amphibious causeway pontoon was placed in a four point moor about 600 feet offshore, just beyond the point of appreciable surf action. The cable was pulled by the two crawler tractors on shore across the causeway's deck in 75 feet increments. Each time, a 75 foot length of cable was encased, adequate floats were applied, and the encased cable was floated progressively ashore until it reached the shoreline.

There, the cable was secured to the deadman anchor and divers began cutting away the flotation balloons lowering the cable to the seabed. The following day, as the causeway pontoon underran the cable seaward, Seabees onboard applied the remaining 900-feet of split pipe. Both of the latter cables were laid and encased in just four days representing a significant time saving over both previous encasement techniques.

As an additional safeguard against cable motion and possible fatigue failure, it was decided to cement U-bolts into the rock bottom about each encased cable at ten foot intervals. The U-bolts were fabricated from large diameter reinforcing bars, each four feet long and bent to fit around the split pipe. Divers, heavily weighted down in order to apply sufficient force to the hand-held pneumatic drills to penetrate the bottom, spaced and drilled the required holes on both sides of each cable. Mixing a fast drying hydraulic cement while under water, the divers placed and cemented nearly one hundred U-bolts about the four encased cables. Where the encased cables spanned small ridges and crevasses, they were secured in place by wire rope anchor lines running to rock bolts embedded in the bottom.

While the underwater workers were completing the surf zone cable immobilization, additional teams of Seabees were busy installing technical equipment and related systems at the laboratory and power plant, and laying four lead-jacketed shore cables. These latter cables were onshore extensions of the inshore cables and ran between the terminal vault and power plant. By mid-September, all personnel and equipment were readied for transport back to the United States, having successfully completed a demanding inshore cable task.

Neither Santa Maria nor the Seabees were to see the last of each other. During the winter of 1971, thermistor chain was needed to replace the original inoperative thermistor string on the range, the American NCF team was again requested to install the shore and inshore cables. A second cable was deemed advantageous to serve as a shoreward link to an underwater acoustic system for range navigation. The only significant difference between the 1970 and anticipated 1972 operations was that the French cable ship *Amphere* would not be available on site until October of the latter year — well beyond the weather window for safe diving operations.

Following a study by Underwater Construction Team-One (where many of the 1970 AFAR personnel had since been assigned), in conjunction with NAVFAC's Ocean Engineering and Construction Project Office, it was decided that UCT-One could install the shore and inshore cables during the summer of 1972. The plan was to lay the inshore cables from the well deck of an LCM-8 using the reeled pipe laying technique of the Navy's Amphibious Construction Battalions. The French cable ship had meanwhile agreed to deliver the necessary cable lengths to the Azores Archipelago prior to the American team's arrival.

Following an intense period of planning and preparation with an eye to the September weather window deadline, five personnel of UCT-One arrived at Lajes AFB, Azores, with the necessary equipment and materials to install two drum winches and their power source in the well deck of one of two borrowed LCM-8s. Making best use of the "Can Do" Seabee attitude and some well devised jury rigging, the UCT detail succeeded in winding each 1.25 mi. length of cable on the two winch drums. Augmenting one enlisted coxswain and six Portugese enginemen/riggers from the Army unit at Lajes, the NCF personnel sailed their LCM-8s to Santa Maria. There they joined forces with the remainder of UCT-One already underway with base camp construction.

On 1 July 1971, the two LCM-8s, lashed side by side, bow to stern, were secured in a four point moor which had been installed 1500 feet from shore by divers two days earlier. Similar to the 1970 operations, the first cable was gradually floated ashore utilizing flotation balloons and the hauling force of a 5-ton cargo truck. Once the shoreward cable end was secured by means of shackle and Kellam's grip to the existing deadman anchor, the cable was guided into place above the existing offshore track and lowered to the bottom by divers detaching the buoyancy floats.

By early afternoon, the LCM-8s were ready for breaking moor and taking to sea. While personnel aboard the winch-contained LCM-8 controlled cable payout and tension by applying the necessary winch braking force, the Army coxswain aboard the second LCM-8 controlled both vessels' speed and heading. As prescribed in the operations plan, the cable was laid out along a track two depth distance from the existing cables out to, and along, the 100 meter contour so as not to subject the cable to excessive water depth. This last segment of cable track was navigated with the aid of two transit stations set up on shore and a fathometer. Information from both the stations and fathometer was used in conjunction with a prepared bathymetric chart developed from soundings taken by UCT-One.

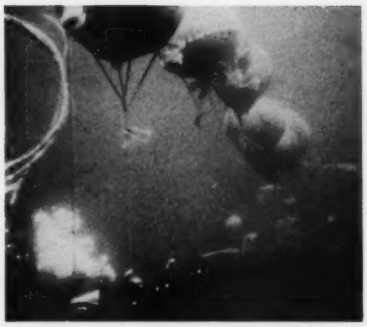
Two days later the second cable was similarly laid without incident. This set the stage for a July 4th celebration which included a Portugese prepared fresh fish and lagosta (lobster) dinner — complete with movies and fireworks for the benefit of a tired team and local inhabitants alike.

The following day, while a four-man team was engaged in laying the shore cables, two diving crews began staging the split pipe protectors along the cable route. Utilizing air-impact wrenches and pneumatic drills and drawing on experience gained from similar cable installation and repair projects, UCT-One completed the protection and stabilization tasks on both cables in fourteen working days.

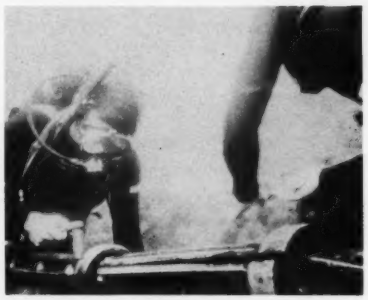
Nearly one month after arriving on Santa Maria, UCT-One had successfully completed two cable landings and stabilizations and were packed and ready for direct embarkation to a North Atlantic site and yet another underwater task in the growing list of accomplishments of the NCF underwater construction team.

Since the successful installation of the transmitting antenna array during the summer of 1971, the Navy Underwater Systems Center, tasked with the responsibility of range operations, has been conducting on-going transmission-measurements of the effects imposed by stormy weather and rough bottom topography upon propogating sound signals. While the results of these studies are disseminated to each of the participating NATO nations, Italy, France, and Germany, to name just a few, have used the range for independent oceanographic - acoustic studies from their own surface and subsurface vessels.

The successful accomplishment of ocean projects such as the cable landings and stabilizations of Project AFAR has demonstrated the ability of the NCF with the support of NAVFAC to perform successfully in the marine envnronment. Even more important, these accomplishments have provided a source of knowledge and experience upon which to advance the navy's capabilities in ocean engineering.



Flotation balloons suspend cable in water while it is being hauled ashore to prevent chafing on the rocky sea floor.



Conventional method of applying split-pipe cable protectors requires divers to install them underwater while cable is still suspended by flotation balloons.

Innovated technique for applying protectors to 30 foot lengths of cable on the beach, after which the length is towed into the water to be submerged and joined with the previously installed sections.

Installing cable protectors in the dry saved nearly one month for the operation as compared with conventional underwater method of installation.

LANTDIV Studies Facilities Needs in Mediterranean

By LCDR R. P. BILDEN, CEC, USN

• Norfolk, Va.

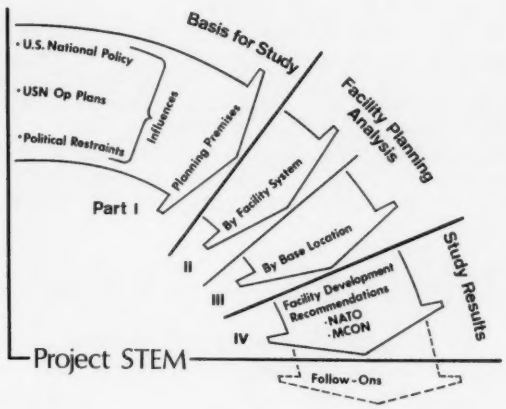
A Mediterranean Regional Facilities Study, with the task name of Project STEM, has been under preparation since July 1972 by a specially-created task group formed within the Facilities Planning Department, Atlantic Division, Naval Facilities Engineering Command, Norfolk, Va. The task group consists of the project officer, LCDR R. P. Bilden, CEC, USN, and five planners with expertise in master planning and the shore installations and facilities planning and programming system. The study sponsor is Commander in Chief, U.S. Naval Forces, Europe.

STEM, an acronym for Study The Entire Mediterranean, may best be defined as a long-range (through the 1980's) regional study of shore facilities necessary to provide support for current and future logistic requirements generated by U. S. Navy operating forces within the entire Mediterranean area. Project STEM is unique in that it is the first regional study of its type that provides a rationale and specific recommendations for follow-on studies including detailed master planning efforts at Mediterranean U. S. Naval Bases and naval complexes predicated upon fleet requirements. The accompanying figure gives a graphic table of contents of the study document.

Project STEM had its genesis in the realization that many divergent influences are present in the Mediterranean that have ben randomly forcing, rather than rationally guiding, facilities development. Of perhaps greater significance, the existing facilities available to the fleet are not optimum and have placed undue constraints on the U. S. Navy strategic and operational planners in forcing operations to be tailored to existing support.

Recognizing that logistics planning must be conducted on a coordinated and integrated basis with operations planning, STEM encompasses the entire Mediterranean region as an "ocean", within which the fleet must conduct its operations. Within this context of an "ocean" analysis, the study has been reviewing and analyzing functional groups of shore facilities as regional facilities systems capable of supporting fleet logistic requirements from various countries. The facility systems were originally selected after an analysis of key logistic support requirements disclosed those requirements which were considered to be "facilities dependent". The systems identified for STEM include: POL, ammo, ports, aircraft basing(ship repair, aircraft repair, communications, air logistics, cold iron, dependent support and medical.

Each system has been studied in terms of facility requirements which are predicated upon a particular concept of operations. The planning recommendations have been developed through the analysis of facility deficiencies and excesses in respect to existing assets, from both the regional facility system aspect and an ensuing capability analysis of a specific geographic location. The final product of the analysis is the formulation of "functionally described" facility construction project recommendations, along with specific follow-on actions necessary to implement the recommendations. In this respect, STEM has been striving to identify required new facility capabilities and recommend locations, phasing and funding sources — both U. S. and NATO infrastructure — answering the questions of what, where, how, when, and why. Although



STEM is principally a study of peacetime requirements, it has taken into account the influence of contingency and wartime strategies to optimize peacetime development for wartime use in formulating planning recommendations.

Now that the reader has hopefully achieved a partial understanding of what Project STEM entails, perhaps we should dispel some of the myths associated with an undertaking of this magnitude. STEM is not a panacea. It will not solve all of CINCUSNAVEUR and LANTDIV's problems. It is only surfacing those major problems which are facilities oriented and point the way toward a coordinated solution. On the other hand, STEM is not just another study. STEM should be readily recognized for its value as a prime mechanism to show the big picture. In this respect, it can and should become the primary management tool for the coordinated prosecution of both single activity and inter-activity projects at all levels, from CINCUSNAVEUR down to the commanding officer of an individual Mediterranean activity. It should also be used as a source of integrated requirements to justify MCON and NATO infrastructure dollars.

Yet, STEM is not a detailed study. It is only recommending broadly defined corrective facility projects. Future detailed facilities planning will still be needed to identify in detail the specific and finite facility implicatons of strategic and operational plans.

Nor has STEM been a simple task. Due to the necessity to conduct logistic planning in concert with operational and strategic planning, the brick and mortar-oriented planner has often been at a complete disadvantage in fully recognizing and appreciating operator problems. This factor alone perhaps answers the prevalent echo often heard from our younger officers: "Why do we need OCS — we're engineers."

Nevertheless, the study is nearing completion, and from all indications, to the satisfaction of the sponsor and the fleet. There will obviously be additional "lessons learned" to add to those already experienced. It is also difficult to argue that a study such as STEM is not a long overdue step in the right direction. Hopefully, Project STEM will be the impetus for additional regional facility studies in the future.

The first Air Force C-141 Skylifter transport to land on Diego Garcia's nearly-completed runway arrived Christmas Day, 1972 to disembark entertainer Bob Hope and his troupe. The cast spent the day performing for Seabees of NMCB-62, NMCB-133 and members of the Naval Logistics Support Group, who had been at work building a Naval Communications Station and related facilities on the remote atoll in the Indian Ocean.

The star-studded assembly and the festive occasion obscured the notable accomplishments of the Seabees who had cleared the space and completed 6,000 feet of the planned 8,000 foot coral concrete strip in the first use of slipform paving by the Naval Construction Force.

LCdr. John Ster describes the background and the scope of construction by the Seabees in the following article. A further article, describing the slipform paving technique, follows.

Camp C. S. Cummins, with desalinization barges in the lagoon.

DIEGO GARCIA Seabees Meet Challenge

By LCDR JOHN W. STER, CEC, USN
Executive Officer, NMCB-62

• Diego Garcia

Diego Garcia, one of the 52 coral atoll islands of the Chagos Archipelago, is located in the Indian Ocean 960 miles south of India and seven degrees south of the equator. It has a roughly V-shaped configuration approximately 14.7 miles by five miles enclosing a lagoon that forms a harbor. The land itself varies from a few hundred yards to a maximum one-and-a-half miles wide; very low-lying with typical tropical flora and large growths of coconut trees harvested for coconut meat which is dried into copra and exported for use in the manufacture of coconut oil.

Build-up of Construction Forces

By agreement with the government of Great Britain, owners of the Chagos group, the U. S. Navy commenced construction of an austere naval communications station and support facilities in early 1971.

In January, a nine-man advance detail from Headquarters, CBLANT and Naval Mobile Construction Battalion 40 debarked to confirm planning and engineering information prior to arrival of construction personnel. On March 10, 1971, a landing party of 50 men from NMCB-40 arrived and began pioneer surveying and clearing away the thick jungle growth to provide space for amphibious offloading of NMCB-40's advance party — which arrived March 20 — and to set up a tent camp, a self-contained portable medical unit and an air-transportable communications unit. All this was accomplished by March 24. Additional Seabees continued arriving until mid-May, when NMCB-40 reached full strength of 750 men.

Provided with over 600 pieces of construction and automotive equipment, the battalion initiated the interim and permanent construction objectives.

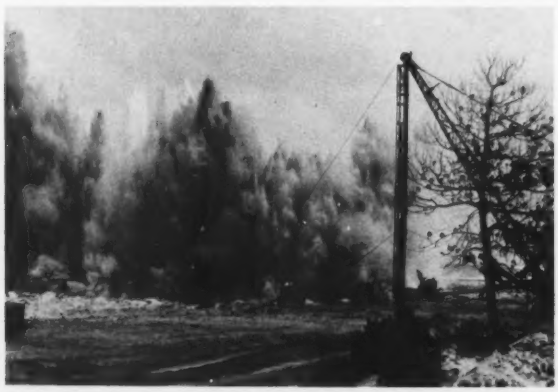
Initially, the continuation of the base camp, construction of a 3,500 foot interim aircraft runway and setting up an industrial plant were of prime importance. The first C-130 airplane landed July 9, 1971, just four months after the first Seabees arrived.

After eight months, NMCB-40 was relieved by NMCB-1, which in turn was relieved in mid-July 1972 by NMCB-62. Detachments from both Atlantic and Pacific battalions have augmented the on-site battalion, with units from NMCB-71, NMCB-10, and, most recently, NMCB-133.

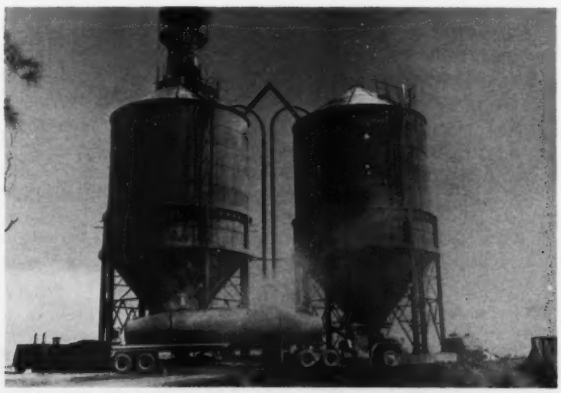
Construction Mission

In addition to stand-by electric power generators adjacent to both the transmitter and receiver sites, the Seabees are constructing all utility systems including a 6,000 KW power station and a 60,000 gallon-per-day desalinization plant, transportation and maintenance shops for the public works department, a cold storage plant and a general warehouse.

The industrial plant consists of automotive and construction equipment maintenance shops, an asphalt plant,



A coral reef was blasted for aggregate for construction.



Cement is loaded from silo to cement bulk trailer.

Mobile crane lowers heavy pole into hole as crew stands by.

two bulk cement silos, two concrete batch plants, four rock crushers, a concrete block plant and concrete precast yard.

Coral is blasted from selected sections of the reef and processed into many gradations of aggregate for use in making concrete and asphalt, the latter producing paving material for 20 miles of roads and parking surfaces.

The 8,000 foot concrete runway, taxiway, parking apron and a small operations building are nearly completed. A POL storage area has been constructed at the end of a mile-long causeway from the island proper into the deep water lagoon.

Camp Facilities

The cantonment area consists of enlisted and officers' quarters, subsistence buildings, administration building, chapel and education center, and austere support facilities for the communications station.

The Seabees and support commands, including Logistics Support Component, Air Transportable Communications Unit 4 (ATCU-4) and a small ROICC staff are berthed in Camp C. S. Cummins, a 1200-man cantonment comparable to those formerly built in South Vietnam with full galley, medical and dental facilities. All berthing huts and office structures are plywood Southeast Asia (SEA) huts accomodating up to 16 men each.

Fresh water is produced by two desalinization barges moored in the lagoon.

The majority of replenishment supplies are received monthly from Naval Construction Battalion Center, Davisville, R. I.

Commissioning ceremonies for the Naval Communications Station, Diego Garcia were conducted March 20, 1973. Concurrently, the eight-month employment of NMCB-62 came to an end and the battalion was relieved by Gulfport-based NMCB-74. The construction schedule for the Naval Construction Force at Diego Garcia calls for employment of Seabee battalions into mid-1975.

SLIP FORM PAVING SPEEDS WORK

The horizontal slip form paving technique used by NMCB-62 on the runway at Diego Garcia, is a well-recognized and frequently-utilized construction method within industry, but is the first use of this paving method within the Naval Construction Force. Another unique factor is that concrete with coral aggregate is being used. It is believed that slip form paving with coral concrete represents a first in construction practice.

The base course is placed and compacted, then very finely graded to provide a proper surface for the slip form paver and to meet specifications. The slip form paver places a 25' wide by 11" deep continuous concrete ribbon to form lanes of the runway, taxiway and apron. The track-mounted paver may operate directly on the base or on the previously placed adjacent concrete lanes. A very stiff concrete mix with 1" to 1½" slump is placed directly on the base by dump trucks. The paver then distributes the concrete across the 25' width of the lane with augers. As the paver progresses, the distributed concrete is agitated by 24 high-frequency vibrators mounted on the front of the paver and extending down into the depth of the concrete. The concrete is then floated with a screed integral to the paver and a drag pan at the rear of the paver. Header boards integral to the paver form the edges or sides of the lane, together with a construction joint.

As the slip form paver proceeds along the lane, it is followed by a separate self-propelled tube float finisher, which makes two passes over the surface to bring cement paste to the surface and finish it. After these two passes, the tube float finisher then drags burlap over the lane for its final surface finish. A curing compound applicator follows as the next sequence.

About eight to ten hours after paving, a transverse concrete saw forms weakened plane joints in the paving lane.

Paving speeds averaged two feet per minute at Diego Garcia and the crew averaged 1,000 feet of paving per day. NMCB-62 started paving operations in late July 1972 and completed the main runway, the taxiway and the parking apron before they completed their deployment in March 1973. Their rate of progress was limited by the quantity of bulk cement that was shipped monthly to the island. Paving operations were generally carried out for two weeks each month until the cement supply was exhausted. The crew then completed final preparations of base and survey control until additional cement was received and the next paving sequence was begun. The airfield project was controlled by a CPS, as was all construction on Diego Garcia.

Slipform paver lays concrete strip for aircraft runway.

Containership Offshore Offload Concepts

Basic equipment in NCEL's offload concept tests included a containership, the LST 1191; the YD-type barge crane; a 42' by 90' working barge; forklift; truck trailers and causeway.

NCEL Tests Methods For Non-Self-Sustained Ships

• Port Hueneme, Calif.

Increased containerization of equipment and supplies for transport has created a logistics problem for some military operations which rely heavily on this mode of transportation in commercial ships.

How can the army and navy safely and quickly unload cargo from a non-self-sustaining (no crane aboard) containership in the open sea or where berthing is not available?

How can 10-20 tons of cargo in 8'x8'x20' containers be safely transferred from the cargo ship to a smaller ship?

How can unpredictable and treacherous wave/swell action between ships be minimized or compensationed for?

What is the surest, fastest method of transferring cargo from ships, perhaps a mile out to sea, to the beach?

The Naval Civil Engineering Laboratory conducted tests during two weeks of harbor and open sea operations off San Diego, Calif. in March 1972 to evaluate their concepts for answering these questions. Further proof of their methods was sought in the joint Army-Navy exercise, OSDOC II (Offshore Discharge of Containerships) last October in the Atlantic Ocean offshore from Fort Story, Va. NCEL was designated as the lead navy laboratory for the evaluation of the floating crane, causeway ferry and beach components, including planning and pre-testing, following the army's first exercise, OSDOC I, in December 1970 to determine the capabilities and problems associated with offloading a self-sustained containership (permanent crane aboard) in the open. The navy provided technical evaluators for that exercise, then offered fleet support and joint participation for the OSDOC II trials. NCEL developed its concepts and tested them in the Pacific Ocean off San Diego in the intervening period.

San Diego Tests

The NCEL concept calls for a floating crane to hoist containers from the containership to a working barge, from which a forklift places them on trucks for the ship-to-shore movement via a pontoon causeway ferry shuttle through the surfline, across hardened beaches and to a stabilized storage area. This procedure is termed the "Roll on-Roll off" (Ro-Ro) method.

Existing-inventory equipment included a navy floating 100-ton YD-type barge crane, standard NL pontoons, Marine Corps truck/trailers and On-Fast and Mo-Mat beach hardening.

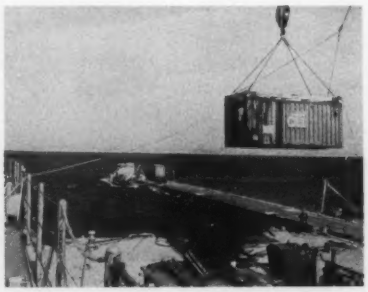
The Amphibious Forces, Pacific Fleet, provided the *USS Racine (LST 1191)* for use as a containership. Fifteen containers were loaded with concrete weights; 13 grossing 12 tons and the other two were 22 tons. Men of Naval Beach Group One and Amphibious Construction Battalion One performed the cargo shuttle operations.

The barge crane was supplied and operated by personnel of the Public Works Center, Naval Station, San Diego. In addition to supplying vehicles and drivers, the marine's Assault Amphibian Test Branch from Camp Pendleton installed and operated a pressure transducer in the surf to secure measurements of wave heights at the landing site.

The Oceanographic and Geodetic Branch of the Pacific Missile Range, Point Mugu, Calif., provided a surface-riding wave gage; the Lousiana State University's Coastal Studies Institute supplied a current meter and tide gage which were installed at the ship site; and the Naval Ship Research and Development Center, Carderock, Md., contributed equipment to measure barge crane motions.

Before conducting its engineering tests in March 1972,

Special frame is used for lifting standard sized containers.



Tagline controls pendulation as container is hoisted to barge in choppy seas.

Forklift moves standard 12-ton container from barge deck for transfer to beach.

the laboratory probed four primary problem areas encountered during OSDOC I: (1) the relative motions between the landing craft and crane container; (2) alignment and placement of the container on the trailer in the landing craft; (3) a sand bar at the landing site which restricted landing craft operations; and (4) removal of the trailer (with container) from the landing craft at the beach/surf zone.

R. C. Towne, senior project engineer at NCEL and coordinator of the harbor-sea engineering tests, said the basic OSDOC I problems were answered by features incorporated into the laboratory concepts. They are:

(1) By placing containers onto a large pontoon work barge, the relative motion problem was minimized. The work barge is 42 feet by 90 feet and was placed alongside the crane barge. Providing a spacious work area, the work barge allowed for seven feet or more of pendulation (motion) of container with no danger of damaging adjacent structures.

(2) The problem of relative motion was eliminated by using a conventional fork lift (in this case with 20-ton capacity) to transfer container from work barge to truck/trailer parked on the same platform.

(3) In 3-5 feet waves, a causeway ferry (270 feet of pontoons) was propelled into position and connected with a moored pontoon causeway (eight 90-foot sections of pontoons or 720 feet total). The moored causeway traversed the sand bar, eliminating this particular obstacle to shuttle operations.

(4) The causeway/ferry with mounted truck-trailers affords rapid transportation of containers from the open sea to storage areas on the beach. Propelled by two standard pontoon warping tugs, the ferry covers a nautical mile within 30 minutes. After hookup with the moored causeway, the vehicles are driven down the ramp to inland areas within four minutes, avoiding container-handling problems in the surf.

Trying to adapt existing equipment to their engineering tests, NCEL personnel installed a conventional power tagline system aboard the crane barge to assist positioning the container and controlling load pendulation.

J. J. Traffalis, senior project engineer at the laboratory and assistant test coordinator, said the system, although not designed for rough open sea operations, did prove beneficial. But he added that engineering improvements are necessary to achieve maximum efficiency. The crane operator and rigging crews reported the tagline did help to steady the container in the wind and helped lessen pendulation.

Traffalis, in charge of tagline/crane operations, said the tagline was employed primarily to steady the container or spreader/container while hoisted by crane from the containership to the work barge.

Realizing the importance of accurate data regarding barge and containership motion under actual open sea conditions, the engineering tests included extensive instrumentation.

The roll, pitch, heave, surge and vertical acceleration of the crane barge were measured by a portable ship motion data acquisition system developed by the Naval Ship Research and Development Center. The unit measures roll angle, pitch angle, heave acceleration and impact acceleration. A vertical gyroscope measures angular displacement about the roll and pitch axes. True heave acceleration is measured by an accelerometer mounted on an internal stable platform of the gyroscope. All data is recorded on a portable tape recorder. Nine data runs of a minimum 28 minute duration were made.

Barge/ship motion data, as well as wave data recorded during the nine test runs, were digitized, computer processed, and plotted in the form of power density spectra. Various statistical properties of the barge/ship motion were computed; such as the significant and average of the 1/10 highest values of the roll, pitch and heave amplitudes.

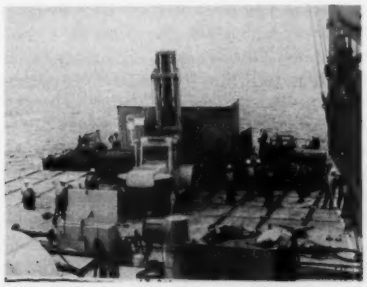
The engineering tests revealed the NCEL offload concept is capable of operating safely in a maximum sea state 3 conditions. Wave heights (5-6 feet) for a 12-second period can be tolerated while containers are unloaded by crane from the containership, to the working barge, aboard truck/trailers, onto the pontoon ferry, shuttled to the beach or moored causeway, and finally driven down the ramp to the safety of a beach storage zone.

Accurate measurement of waves near the containership is important to determine the general sea state. Accordingly, a wive-riding buoy was placed in the water. A steel sphere 27.5 inches in diameter, it contained an accelerometer, integrating circuits, telemetry circuit and batteries. The buoy-displacement signal was telemetred about 3,000 yards to the beach where it was recorded on both paper strip chart (one centimeter on the chart per one meter displacement of the buoy) and magnetic tape.

Laboratory evaluators recommended the floating crane/causeway ferry shuttle concept for the joint-service OSDOC II exercise. They also pointed out the apparent ability of trained equipment operators to perform concept tasks with a minimum of special training and guidance.

Towne said that before an efficient and safe system of discharging containers from ship-to-shore can be achieved, engineers must first develop: (1) an improved floating crane concept; (2) mooring lines and fender forces (ship/barge protection); (3) efficient operation of moored causeway and ferry in surf 7 to 9 feet; and (4) a reliable power tagline to gain pendulation control.

Joint Army-Navy-Marine Corps exercises held in OSDOC II off Ft. Story, Va. are described in the article on the next page.



Container is placed on Marine trailer aboard pontoon causeway/ferry.

Loaded truck trailer caravan on causeway/ferry being propelled by tugs.

Container loaded truck/trailer drives down end ramp onto hardened beach.

OSDOC II EXERCISES TEST OFFLOAD METHODS

By MILTON ESSOGLOU and D. OLSON
• Washington, D. C.

OSDOC II (Offshore Discharge of Containership) held off Fort Story, Virginia, was the third of a series of operational exercises involving the Army, Marine Corps, and Navy. The primary purpose of OSDOC II was to test the means now available to offload a non-self-sustaining containership in an open sea environment and to identify/confirm more precisely the technical development problems. Existing and some experimental equipment were tested. The test has generated some data for interim "make-do" capability to discharge containerships in the absence of port facilities.

A non-self-sustaining containership *SS Warrior* was leased from a commercial firm for use throughout the exercise. During the first two days, containers, palletized cargo, and empty containers (helo lift limit) were discharged from the *SS Warrior* to navy ships (DD and AE). The *SS Warrior* was then moored one mile off Fort Story and used in subsequent ship-to-shore tests of the following components:

1. Offloading of *SS Warrior* by:

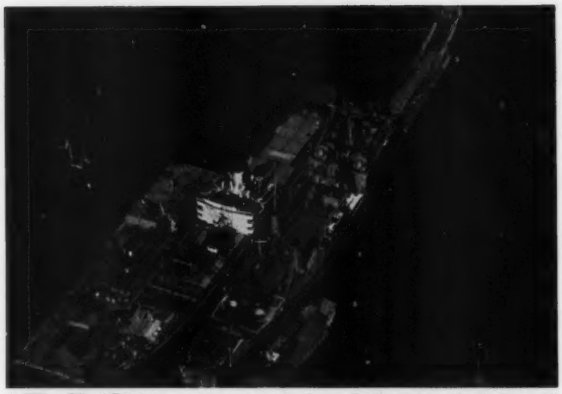
(a) 250T mobile crane on floating DeLong Barge (BPL).
(b) An 1179 Class LST with 250T mobile crane mounted on helicopter deck.
(c) *SS Florida* (a converted C-4) with its own pedestal-mounted boom cranes.
(d) 80T mobile crane mounted on *SS Warrior* itself (self-sustained)

2. Ship-to-shore movements were carried out by:

(a) Navy pontoon causeway ferries.
(b) Army and Navy Utility Landing Craft (1446 & 1610 Classes)
(c) Army Bulk Cargo Barges (BC)
(d) Air Cushion Vehicle (ACV) *Voyaguer*
(e) Helicopters (OH-46, CH-53, CH-54)

The helicopter offloading using CH-54B and C-47C had been extensively evaluated during OSDOC I. In this test, ship-to-shore movement of 8'x8'x20' containers and 8'x8'x 6 2/3' TRICONS using the CH-53's took place. Army's CH-54s were used to expedite administrative retrograde because of limited availability of containers on the ship.

Marine Corps tractor/trailer with two containers preparing to descend ramp from pontoon causeway/ferry to beach.



LST with 250 ton crane mounted on helicopter deck for offloading of containership. Movement to shore here is by utility landing ship.

Preliminary reports from OSDOC II show that expedient facilities, which can perform the same job that port facilities do, can be provided in a hurry in a forward area utilizing barge or ship platforms with essentially commercially available mobile cranes. If the water depth near shore is not great enough for the 30′ plus or minus draft of the modern containerships, the discharge complex can be moved further offshore instead of dredging. In advanced base areas, there would be no need to wait six or more months (time required for permanent structures) before containers or other cargo can be offloaded.

An elevated, jack-up type platform connected to the shore via floating causeway was also planned as a means to provide a platform in 12′ of water for the offloading of non-beaching BC barges. However, the causeway broke up just before the test as a result of two storms and inadequate anchorage and other design and construction deficiencies. This failure highlighted ramp-causeway problems as well as the need to develop into operational capability, the ability of the Naval Construction Force to jack-up causeways as easily and routinely as they install floating causeways.

The OSDOC exercises have demonstrated the requirements for significant improvements in (a) fleet moorings and procedures and techniques for mooring commercial ships to navy moorings, (b) On-Fast application techniques, (c) jack-up platforms, and (d) beach development work.

The requirement for a platform in about 12-15′ feet of water has been accelerated by the existence of some 26 barge carrying ships (i.e., national inventory of 5,000 barges). These barges (LASH and SEABEE) draw about 10′ of water fully loaded. Industry intends barge ships for break-bulk cargo that cannot go via containers. Barge ships are very likely candidates for military cargo carriers early in any contingency involving the navy-marine Corps team. While DeLong platforms are adequate, they can be towed at about 5 knots. The Naval Construction Force must be able to erect the equivalent platform capability, assuming it is transported, using commercial ships augmenting navy ships early in a contingency. Hence, the importance of developing elevated platforms for crane support and causeways into operational systems.

NOTE: A discussion of Project ELF (Expeditionary Logistic Facility) in the Spring 1972 issue of *The Navy Civil Engineer* considered the economic constraints and training requirements incident to the development of offshore unloading systems and equipment.

WESDIV Wins Three Awards In DOD Design Competition

• Washington, D. C.

The Western Division, Naval Facilities Engineering Command has won three out of five awards including top honors in the First Annual DOD Design Awards Competition for military construction projects.

Competition was divided into five categories with a first place award being given in each category. The judges found, however, that two projects in the family housing category were deserving of first place award. Therefore, dual first place awards were given in that category. In addition, a top award known as the Secretary of Defense Blue Seal Award was given for the best in competition.

Competing designs were judged by a professional jury appointed by the American Institute of Architects and the Consulting Engineers Council.

WESTDIV took the honors in the following categories: medical facilities, architectural facilities, and welfare and recreational facilities.

The Western Division was the winner in the medical facilities category for the construction of the Thompson Medical Library addition at the Naval Hospital, San Diego, California. It was for this project that WESTDIV took the top prize, the Blue Seal award for best in competition.

WESTDIV also took honors in architectural facilities for the engineering management building at the Puget Sound Naval Shipyard, Bremerton, Wash., and in the welfare and recreation facilities category for the Main Exchange at the Marine Corps Air Station, El Toro, Calif.

Dual awards were made within the family housing category and were made to the U.S. Army Engineer District, Baltimore, Md., for the 100 family units located at Vint Hill Farms, Va., and to the U.S. Army Engineer District, Sacramento, Calif., for 102 units at the Presidio of San Francisco.

The winner in the engineering facilities category was the U.S. Army Engineering District, Los Angeles, Calif., for the environmental radiation test facility located at Fort Huachuca, Ariz.

Thompson Medical Library, Naval Hospital, San Diego

Engineering-Management Bldg., Puget Sound Naval Shipyard

Marine Corps Exchange, Marine Corps Air Station, El Toro

CONTAINERIZATION OF ORDNANCE

By R. E. SCHEETZ

• Washington, D. C.

During the past two years, the Naval Facilities Engineering Command has played a significant role in the technical design of facilities and selection of equipment for shipping ordnance in containers.

This "containerization" concept demonstrates significant improvements in the operation used for transporting ordnance by (1) decreasing the time required for loading and unloading ships from seven to ten days down to twenty-four hours, thus reducing the logistic response time in emergency situations; (2) increasing explosive safety by consolidating an average of 12 pallets into one sealed container, thereby minimizing the number of handling operations; (3) loading the containers at the depots or at the points of manufacture, thus eliminating multiple handling of pallets; (4) using the container as a magazine for temporary holdings; (5) allowing the ship to move in and out of port expeditiously, thus helping to eliminate port congestion; and (6) providing greater security and environmental protection of the ordnance material with a net reduction in individual packaging.

Equipment and facility requirements were developed for the two Port of Embarkation stations of Naval Ammunition Depot, Earle, N.J., and Naval Weapons Station, Concord, Calif., and the three inland depots of NAD Crane, Ind., NAD Hawthorne, Nev., and NAD McAlester, Okla. The approximate cost for completing this program is $6,500,000 for equipment and $38,000,000 for military construction.

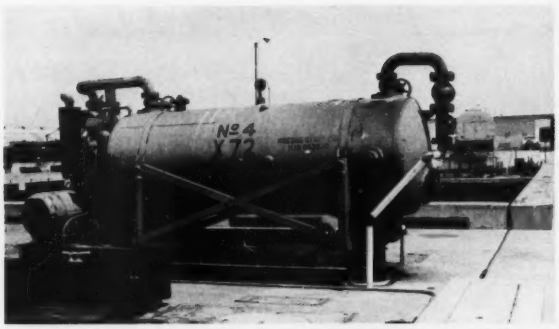
It is estimated that the "containerization" concept could eventually reduce the cost of outloading ordnance from the current rate of approximately $17.50 per measurement ton to an estimated $4.00 per measurement ton for an annual savings of approximately $19,000,000.

One of the many projects used to test this concept was "Autumn Leaves East/West." This project was part of the first phase of a three-phase program with the ultimate goal of full containerization capability at many of our naval stations here and abroad.

Pierside Collection of Bilge Waste From Amphibious Craft

By TOM STONE

• San Diego, Calif.



Vacuum unit transfers oily waste water from small craft bilges to a shore-based receiving tank trailer with a capacity of 800 gallons.

Historically the amphibious craft at the Naval Amphibious Base, Coronado, Calif., have pumped bilge wastes directly into harbor waters. The impact of directives that prohibited pumping of bilge residue collected in port into open waters prompted tenant commands to request that the base provide adequate facilities and services for collection and disposal of bilge residue in an approved manner. By an engineering service request, Western Division, NAVFAC, San Bruno, was requested to perform an engineering study to establish the extent of the oil pollution problem and (a) offer an interim or short-range solution and (b) develop a long-term or permanent solution.

A field visit was made to the base and in company with the operations officer, Naval Beach Group I, the craft berthing area was surveyed. Next the various types of craft were boarded to make observations of bilge configurations, piping and pumping equipment.

Alternate solutions for a quick, low-cost solution to the problem were considered and the following findings were made:

a. The use of a standard navy oil disposal raft known as a "donut" was not possible because of the shallow water in the berthing area. The loan of such a unit from the Naval Station, San Diego was possible.

b. The lift capacity of the craft bilge pumps would not permit discharge to containers on the piers. In addition some craft utilized eductors for bilge pumping and the quantity of fluid to be handled was unacceptable.

c. No small barges were available to be used for collecting the bilge wastes.

d. Discussions with tenant activity commanders determined that a pier or shore mounted vacuum assembly offered the best single means for removal of oily wastes and water from the LCU's, LCM-8, LCM-6 and other small craft supported by NAB. Currently there are approximately 200 craft berthed at the NAVPHIBASE Coronado.

In that expedience was paramount in the solution of the problem, a survey was made to locate available assets in the San Diego area that could be borrowed or obtained on a no-cost basis to accomplish the project. Visits were made to several activities known to be using vacuum pumping equipment. The object of this effort was to locate an assembled unit that could be used immediately without alteration or additional items. It was found that the Supervisor of Shipbuilding, Conversion and Repair, USN, 11ND, Naval Station, San Diego had a suitable unit that could be loaned to NAB on a hand receipt basis. Description of the unit: Vacuum tank skid-mounted with pump, 15HP-3 phase-440 volt-60 cycle-885 RPM motor, 800 gallon receiver tank, total weight 10,000 lbs.

The unit is capable of holding 25-27 inches of vacuum on a 2½ inch line 150 feet long with two 1½ inch lines 40 feet in length to be dropped into the bilges of the crafts to be pumped. A four-way valve permits pressure-blowing of collected bilge residue from the receiver tank to other shore-based holding tanks. The transportation division of WESTNAVFAC located two 5000-gallon tank trailers that could be transferred to NAB for collection, separation and disposal of the oily bilge waters.

With the equipment made available to NAB, the piping plan and operational procedure became relatively simple. This permitted accomplishment of the project within the approval authority of the commanding officer, NAVPHIBASE Coronado. The vacuum unit was located on a transverse pier between piers 11 and 12. This avoided blocking a pier and at the same time placed the unit closer to the craft to be serviced. A 2½ inch plastic vacuum line, 150 feet long, was installed on pier 11 with two bilge stripping stations to service craft brought alongside. A similar 150' line was installed on pier 11 to the pier head to convey the bilge residue to one of the 5000 gallon receiving tank trailers.

The operational procedure for collecting and disposing of bilge residue from the amphibious craft at NAB Coronado is as follows:

a. A 1½ inch hose is dropped into the craft bilge and the accumulated oily waters are transferred by vacuum

Bilge water is pumped from receiving tank into this 5,000 gallon mobile tank.

to the 800 gallon receiver tank of the vacuum unit.

b. When the 800 gallon tank is substantially filled the suction valve is closed, the tank is pressurized to transfer the bilge residue to the 5000 gallon tank trailer at the pier head.

c. The 5000 gallon tank trailer when substantially filled is hauled to a sandy area on the base where the second tank trailer is located. The contents of the trailer are allowed to settle and the water bottom is stripped into the sand. The accumulated oil is then pumped to the second tank trailer.

d. The second tank trailer accumulates the waste oil from the bilge residue as well as all containerized waste oil generated aboard the base. When this tank becomes filled, a contractor is called and the oil is hauled away for disposal or reclamation. The cost of this service is approximately 2 cents per gallon. During the past year over 30,000 gallons of waste oil was collected by the system described above and removed from the NAVPHIBASE.

The tenant activity commanders have expressed satisfaction with the interim bilge waste collection and disposal program. The program for pumping craft bilges has not caused any inconveniences and the improved capability for the disposal of containerized waste oils has been an asset. When the bilge pumping facility was first put into use, the NAVPHIBASE public works officer conducted a training program to indoctrinate tenant activity personnel in the operation of the vacuum unit. Subsequent to this training, the tenant activities have covered all of the operational requirements of the facility. Public works department personnel make a daily check of the facility to assure operational reliability. The only major maintenance cost incurred to date was for the rehabilitation of the pump.

A permanent system for the collection, treatment and disposal of oily bilge wastes at NAVPHIBASE Coronado is in the planning stage and should be included in an early military construction program. The permanent solution closely follows the interim plan and operational procedure.

Facilities Project Manual Lists New Cost Approval Data

By CDR GEORGE LAKE, CEC USN

• Washington, D. C.

"It takes money to make money" . . . Certainly not a new idea but still a very valid concept in the world today and in the navy as well.

Public Law 91-145, amended 10 USC 2674 to allow the Secretary of Defense to establish criteria for the accomplishment of projects having high economic value to the Navy. Prior to this legislation, the urgency criteria outlined in paragraph 2104(d) of the Facilities Project Manual (OPNAVINST 11011.20B) was the only avenue available to justify the use of the MCON minor construction authorization.

Under the new criteria, projects costing less than $300,000 can be approved without a Certification of Urgency provided that the construction ". . . will within three years following completion of the project result in savings in maintenance and operation costs in excess of the cost of the project." These new criteria will be included in the forthcoming update of the Facilities Project Manual, however, appropriate submissions are being accepted now and submitted to secretarial levels.

Definitive guidance relative to the propriety or acceptability of an investment proposal is difficult to develop. A key ingredient is that accomplishment of the project will permit an *existing function* to be more economically accomplished subsequent to the capital investment.

Specifically, it must be demonstrated that the investment involved will reduce existing annual operating expenditures sufficiently to amortize the project within a three year period. Attempts to qualify projects under this authority based on vague savings assigned to increased productivity, cost avoidance, or consolidation of functions will, in all probability, be fruitless.

The best projects are those which clearly demonstrate recoverable savings between operations now and after the facility is provided. The economic analysis must also detail the other alternatives available and conclusively prove that the proposal is the most cost effective of the alternatives and, aside from meeting the three year payback, is the most cost effective long-term solution.

The concept is still fairly new with little precedent established as to what constitutes a good project, however, there are a few examples that can be cited. In the first instance, the construction of a short section of pipeline eliminated the need to truck fuel thereby amortizing the cost of the construction within one year. Similarly connection of two steam plants permitted the shutdown of one plant with the other carrying the total load. There have also been instances where facility construction allowed reduction of personnel, equipment material costs and in some instances inventory.

Consolidation of similar functions and improvements in production methods that eliminate excessive regular overtime or accomplishment of residual workloads by costly outside contracts may also be justifiable if they demonstrate a clear out-of-pocket saving.

Though it may sound complicated at first, it reduces itself to a routine exercise with numbers. Techniques for economic analysis both in general terms and as they apply to urgent minor construction are discussed in NAVFAC-INSTR 11010.53 of 3 October 1972 and will be of assistance in this effort. There are some rules to follow which should help, both in the initial determination whether a project qualifies and later as the project justification develops. These are:

• Consider all alternatives and do a cursory analysis on each before developing the final proposal.

• Concentrate on *current out-of-pocket cost* when projecting savings. Labor cost savings are hard to sustain unless ceiling reductions are envisioned.

• Consider *all* investment costs including new facilities, repair, new equipment, transportation, PCS costs, etc.

• Avoid the use of subjective costs, deferred investments, reduced depreciation or other types of cost avoidance. Increased productivity should be quantifiable and relate to the accomplishment of an increased workload now performed by other means or to reduced personnel requirements to do the same job.

• Conduct the analysis from a total systems approach considering the effect of associated concurrent secondary actions. Currently our EFD's are developing a capability to assist in economic analysis. The majority of the effort, however, will still come to rest at the activity where the improvement is proposed. The ideas, the definition of the alternatives and the raw financial data are found there requiring a major participation on the activities part for the success of any project.

COMMAND

Rear Admiral
WALTER M. ENGER
CEC, USN

Rear Admiral
ALBERT R. MARSCHALL
CEC, USN

Rear Admiral Walter M. Enger, CEC, USN, Commander, Naval Facilities Engineering Command and Chief of Civil Engineers of the Navy will retire from active naval service on 1 June 1973, culminating nearly 32 years of service.

He will be relieved by the present Vice Commander and Deputy Chief, RAdm Albert R. Marshall, CEC, USN, during ceremonies at the Washington, D. C. Navy Yard on May 11, 1973.

Admiral Enger, a native of Urbana, Illinois, received his BS degree in civil engineering from the University of Illinois in 1935.

He was commissioned lieutenant (junior grade) in the Civil Engineer Corps of the Naval Reserve in August 1941. In March 1943 he transferred to the Regular Navy and rose in grade to the rank of Rear Admiral which was attained on August 10, 1965.

His active naval service began in September 1941 as Facilities Officer in the Office of the Inspector of Naval Material in Los Angeles, Calif., and he subsequently served at San Pedro, San Diego, and San Francisco, Calif.

Rear Admiral Enger was awarded the Legion of Merit for exceptionally meritorious performance of duty while serving as Vice Commander, Naval Facilities Engineering Command and Deputy Chief of Civil Engineers from November 1, 1965 to August 29, 1969.

In addition to the Legion of Merit and the Navy Commendation Medal, the admiral holds the American Defense Service Medal; American Campaign Medal; Asiatic-Pacific Medal; Navy Occupation Service Medal, with Asia Clasp; National Defense Service Medal; Vietnam Service Medal; Republic of Vietnam Campaign Medal, and the Antarctica Service Medal.

He and his wife, the former Charlotte Hope Tuttle of Urbana, Ill. have two children, Susan Hope (Mrs. W. A. Riley), and Thomas Arthur Enger.

Rear Admiral Albert R. Marschall, CEC, USN, designated Commander, Naval Facilities Engineering Command and Chief of Civil Engineers of the Navy was born in New Orleans, La., on May 5, 1921. He graduated with distinction from the U.S. Naval Academy on June 7, 1944, and was commissioned ensign, rising in rank to that of Rear Admiral on 1 July 1970.

Admiral Marschall began his naval career in 1944 as a line officer aboard the *USS Ross* and participated in the invasion of Leyte and the occupation of Japan while onboard that destroyer. He had postgraduate insrtuction at the Rensselaer Polytechnic Institute, from which he received the degrees of bachelor and master of Civil Engineering, with consequent assignment to the Civil Engineer Corps.

On March 2, 1970, he became deputy commander of the Pacific division, Naval Facilities Engineering Command, Southeast Asia, with headquarters in Saigon, Republic of Vietnam, with additional duties as officer in charge of construction, Naval Facilities Engineering Command contracts, Republic of Vietnam and Commander THIRD Naval Construction Brigade.

Admiral Marschall's personal decorations include the Distinguished Service Medal; Legion of Merit with Combat Distinguishing Device; Combat Action Medal; Order of Military Merit, Chung Mu (Korea); the National Order (Vietnam), and the George Goethals Medal from the Society of American Military Engineers (1967).

He is a member of the Society of American Military Engineers, Tau Beta Pi, the National Society of Professional Engineers, the American Society of Civil Engineers and the American Public Works Association.

RAdm Marschall is married to the former Marie Gamard of New Orleans. They have five children, Thomas Rhoades Marschall, David Gamard Marschall, Mrs. Laurel Patterson, Pamela Joan Marschall, and Albert Louis Marschall II.

CHANGE

Rear Admiral
DONALD G. ISELIN
CEC, USN

Rear Admiral
JOHN R. FISHER
CEC, USN

Rear Admiral Donald G. Iselin, CEC, USN, Commander, Pacific Division, Naval Facilities Engineering Command, has been named as the new Vice Commander of the Naval Facilities Engineering Command and Deputy Chief of Civil Engineers of the Navy. He is scheduled to report to his new assignment in August.

RAdm Iselin was born in Racine, Wis., Sept. 5, 1922, attended Marquette University for two years, and was graduated from the U. S. Naval Academy at the head of his class in 1945. For the next year he served on the light cruiser, *USS Providence,* flagship of the Mediterranean squadron. In 1946 he was selected for the Civil Engineer Corps of the Navy and studied postgraduate work at Rensselaer Polytechnic Institute, where he received his bachelor's and master's degrees in civil engineering.

He was selected by Vice Admiral Hyman G. Rickover to be the site project officer for the design and construction of the Shippingport atomic power station in Pittsburgh, Pa., the nation's first large-scale nuclear electric power plant. He spent four years with Admiral Rickover, from 1954 to 1958.

In 1967, RAdm Iselin was assigned as special assistant to the Officer in Charge of Construction, Republic of Vietnam. During this period he developed and implemented a new system of construction management under very hostile conditions, called "Level of Effort."

His management abilities and dynamic leadership earned him the Legion of Merit and the Stephen Decatur Award of the Navy League.

He assumed command of the Pacific Division, Naval Facilities Engineering Command and the Construction Battalions, U. S. Pacific Fleet on June 20, 1972.

Admiral Iselin is married to the former Jacqueline Myers of Wilmette, Ill. They have three children, Donna Iselin Broom, Michael, and Madeline.

His parents are Mr. and Mrs. Harry P. Iselin of Cortez, Fla.

Rear Admiral John R. Fisher, CEC, USN, will relieve Rear Admiral Donald G. Iselin, CEC, USN, as Commander of the Pacific Division of the Naval Facilities Engineering Command in July 1973. RAdm Iselin will assume duties as Vice Commander of NAVFAC and Deputy Chief of Civil Engineers in Washington, D.C.

RAdm Fisher was graduated from the U.S. Naval Academy in 1946. Following sea duty aboard the aircraft carrier *USS Kearsarge* and the minesweeper *USS Plover,* he undertook post graduate studies at Rensselaer Polytechnic Institute where he earned his master's degree in civil engineering in 1950.

Transferring to the Navy Civil Engineer Corps in 1950, he served with the Seabees in NMCB-4 and in the public works departments at NAS Barbers' Point, Hawaii and at the Naval Propellant Plant, Indian Head, Maryland.

After completing the course at the Armed Forces Staff College, he served from 1962 to 1966 in Washington in the office of the Secretary of Defense and as Executive Assistant to the Chief of Civil Engineers.

During 1966 and 1967 he served in Manila as OICC Southwest Pacific directing construction in the Philippines and Australia. In 1968 he commanded the Seabees' 30th Naval Construction Regiment in Vietnam.

From 1969 to 1971, he served as the assistant commander for military readiness at the NAVFAC headquarters in Washington, D.C.

In 1971, he attended the advanced management program at the Harvard Business School then became the commanding officer of the Chesapeake Division, NAVFAC; and in 1972 upon selection to rear admiral, he was assigned back to NAVFAC Headquarters as the deputy commander for planning, his present assignment.

He is married to the former Kitson Overmyer of Columbus, O. They have two children, Scott, now serving at an Episcopal Mission in Beaver, Alaska, and a daughter, Mrs. Lani Browning, now living in Annapolis, Md.

Headquarters Items

Key Entry System for FACSO

By LCDR W. G. MATTHEWS

• Alexandria, Va.

It did not take long after third generation computers were introduced to determine that they could crunch numbers and chew data faster than we could feed them. It is no surprise, then, that companies began looking for ways to get data into the computer faster. By the late 1960s a number of systems had been introduced, including key-to-tape, key-to-on line disk, and key-to-disk-to-tape.

In 1970 NAVFAC began evaluating operational systems for possible use at FACSO. On completion of this evaluation, it was determined that while all of these systems contributed some improvement over the standard keypunch/verify operations, the key-to-disk-to-tape system (also called a shared processor system) was found to be the most flexible with the best prospects for increasing throughput.

In October of 1970, NAVFAC requested approval to install a key-to-disk-to-tape system at FACSO. In December, 1970, CNO deferred all action on requests for key entry systems, pending evaluation of two existing systems. This evaluation, completed late in 1971, documented the economy of a shared processor system over keypunch/verify equipment due to increased operator productivity, given sufficient volume.

The FACSO system, a Computer Machinery Corporation (CMC) Key Processing System, was installed in September, 1972. The system consists of a superivsory console housing a small computer and a magnetic tape unit, a separate disk, and 18 keystations.

Each keystation operates independently of and simultaneously with the other stations on the same, or differing jobs and formats in any combination. All keystations are connected to and controlled by the computer, using a manufacturer furnished stored operating system. Data is entered through the keystation, consisting of the standard keyboard with several special keys and a display panel visually showing what characters and field entries are being made. The data is processed and stored on the disk. To verify recorded data, a complete record is retrieved from the disk and stored in the computer for comparison with the source document. After verification, completed batches of work are transferred from the disk to tape for processing by the main computer.

Armed Forces Pest Control Board

By GEORGE L. SIMS, JR., C.E.

• Alexandria, Va.

The Armed Forces Pest Control Board was established by the Department of Defense to serve as a joint activity of the department under management control of the Secretary of the Army in the authority and direction of the Secretary of Defense.

The mission of the board is to function as a coordinating activity in the field of pest control, to serve as an advisory body on this subject and to provide liaison with other agencies as required in matters of pest control.

The board is composed of members appointed from the Departments of the Army, Navy, and Air Force and other selected defense agencies when considered necessary. Member agencies outside the Department of Defense are invited to designate liaison representatives to attend meetings of the board when matters of common interest are being considered. In addition to the agency representative (members), the board consists of an elected chairman, vice chairman, executive secretary, liaison officer and other necessary administrative personnel to support the actions taken by the board.

The board also maintains a Military Entomology Information Service (MEIS) staffed by medical entomologists from the three services whose functions are to collect, evaluate, store and distribute military entomological information and data.

In addition, the board also surveys present and future requirements, making recommendations to the military departments for accomplishing research and development, and training and operational techniques to improve military readiness and efficiency. It also coordinates projects for development and standardization of pest control publications, training, equipment and materials.

While the board has not been established as an operational organization, through its efforts and recommendations, it has had a major influence on the progress and development of entomological and pest control achievements for the military services. Additionally, many of the recommendations and actions suggested by the board have been adopted by other federal agencies.

900 Navy Lodge Units in Use

By A. E. KOSKI

Western Area Branch Head
Family Housing Program
Headquarters, NAVFAC

• Alexandria, Va.

In the past, financial and personal hardships have occurred for enlisted men and junior officers in relocating themselves and their families from one duty station to another, due to a lack of adequate and reasonably priced temporary lodging facilities. Consequently, the product of navy's recent Navy Lodge Construction Program has enjoyel exceedingly great popularity among navy personnel and their families. Under Phase I of the new program, 900 model units have been placed in operation at 13 activities.

The Navy Lodge Program was approved by the Secretary of the Navy on 20 January 1970, under the sponsorship of the Bureau of Personnel who made available a $10 million loan from the Navy Central Recreation Fund for construction of the Phase I program.

Factors considered in selecting the first 13 locations were: Navy personnel considerations; estimated moves per year; available existing temporary lodging support; and available community temporary accommodations at reasonable cost.

Six construction projects based on geographical area were awarded under the turnkey concept which had been found extremely successful in its family housing program. At seven locations (575 units), conventional design and construction was utilized, and for the remaining six projects (325 units), factory fabricated modulars were used. The total program construction cost reached $10.3 million for an average Navy Lodge unit cost of $11,400.

Units provide accommodations to sleep a family of five and are fully furnished with the finest appointments that are available in commercial motel facilities. For larger families, connecting suites are available. Construction also included management and support spaces and vending machine and laundry facilities.

The Navy Resale Systems Office (NRSO) operates and maintains the lodges through the Navy Exchange Program. The net income generated is retained in a reserve account

at NRSO to amortize the original loan in 13½ years and to sustain a continuing program of financial support for new construction and renovation of existing Navy lodge facilities. The temporary lodging assets operated by NRSO now total 1,591 with 366 of these units overseas.

Initial approved locations for a Phase II program are: Great Lakes, Illinois; Rota, Spain; and Roosevelt Roads, Puerto Rico. Additional activities selected for consideration are: Mare Island, California; Long Beach, California, and Port Hueneme, California.

Hyperbaric Design Manual

By DR. M. YACHNIS

• Alexandria, Va.

Sections III and VIII of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code provide an outstanding source of information for design of pressure vessels. However, they do not consider the diver inside the vessel, nor do they present design criteria of viewpoints, life support systems, fire protection systems, communications systems, and other support systems essential for the safe operation of a hyperbaric facility.

NAVFAC (Code 04) has prepared a design manual for new, shore based, man-rated hyperbaric facilities; decompression/recompression facilities; diving pressure tanks; deep ocean simulation pressure chamber complexes; and pressure vessels used for testing equipment.

The manual includes the following chapters: Chapter 1—Pressure Chambers (Man-Rated and Non-Man-Rated); Chapter 2—Appurtenances (Viewports, Doors, and Closures); Chapter 3—Foundations; Chapter 4—Piping; Chapter 5—Life Support Systems; Chapter 6—Wet Chamber Systems; Chapter 7—Fire Protection Systems; Chapter 8—Electrical Systems; Chapter 9—Communication Systems; and Chapter 10—Chamber Operating Control Systems.

The design of hyperbaric facilities is presently based on a variety of code interpretations and requirements, since uniform design criteria do not exist. Therefore, the preparation of such a design manual required a depth of technical knowledge of the existing applicable codes and other pertinent documentation. In addition, an intimate knowledge associated with the use of manned and unmanned shore based hyperbaric facilities was needed.

The general guidance for system certification of hyperbaric facilities combined with the design criteria provided by the "Design Manual for Hyperbaric Facilities" will result in more cost-effective facilities with a high degree of safety, reliability, operability, and maintainability.

UTILITIES PROCUREMENT

By HENRY V. BAZAK

• Alexandria, Va.

As the navy's need for utility services from commercial sources continues to increase from year to year, so does the navy's cost for these services. For FY '72 the cost amounted to $147,300,000. It is forecast that it will reach $160,000,000 for FY '73.

Contrary to general belief, the charges for utilities are not established at single, predetermined, regulated rates. In dealing with local governmental agencies, there is often no regulated rate, and a rate must be negotiated. In other instances, a number of rates could be applicable, and the parties must determine which rate is proper for the navy's unique requirements. Frequently, connection charges are necessary.

In addition to the normal increase in utility usage, today's environmental standards are causing the navy to create new commercial requirements for sewage treatment and natural gas. Abandonment of outmoded power generation and telephone systems contribute to increasing utility costs. Inflation and a rash of rate increases have also added to the upward trend in costs.

NAVFAC has the responsibility of providing these services, negotiating the rates and charges, and administering the contracts to assure that the navy continues to receive service at the lowes rate. Periodic technical review must be done on a timely basis to avoid excess charges where there are increased commercial requirements, changes in load characteristics or a change in the supplier tariff. Timeliness is important since under present utility law and practice the supplier is not obligated to keep the customer on the best rate.

An example of the effect of time and the continuing impact on the navy's bill of a proper rate occurred recently when a supplier sought to change a rate negotiated six years ago which resulted in a cost reduction of $240,000 a year at that time — the cost reduction by FY '71 had increased to $2,600,000 annually.

NAVFAC also has the responsibility of appearing in rate proceedings before regulatory agencies to minimize the impact of any proposed rate increases and to protect the navy's interest.

Every navy employee can do his part to save the navy's dollars by practicing conservation and economy in the use of utility services.

Land Acquisition Policies

By E. SWANSON

Acquisition and Disposal
Headquarters, NAVFAC

• Alexandria, Va.

On January 2, 1971, the president signed into law the first uniform land acquisition legislation that is applicable to all federal agencies. Prior to this, all the different agencies with authority to acquire real estate operated under specific legislation that applied to their agency. For instance, it would be possible that one individual whose property was acquired would be paid moving expenses and another individual could not be paid the same costs by some other agency acquiring land for another project in the same locale. The passage of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 was the culmination of extensive efforts dating back to 1961 to develop legislation establishing a uniform policy for the fair and equitable treatment of persons who are displaced or have their property taken for federal and federally assisted projects. As the title would indicate, the act has two parts that deal separately with the acquisition and subsequent displacement of individuals.

How does this effect navy in acquiring land for its projects? First the relocation aspects. The act provides that prior to undertaking a project that will cause displacement of individuals the navy must make a survey and determine that there is safe, decent and sanitary replacement housing available within the financial means of the individuals being displaced. To aid the individual, the act provides for a payment of up to $15,000.00 to each homeowner over what he is paid for his property based upon a formula that determines the amount necessary for him to purchase a replacement house that is safe, decent and sanitary. In case of a tenant, a payment up to $4,000.00 for rental assistance for a period up to four years or a similar amount to assist in making a down payment on a replace-

ment house is authorized. If safe, decent and sanitary replacement housing is not available, replacement housing would have to be constructed by navy out of project funds. In addition to housing payments, a moving expense allowance up to $500.00 is provided.

In the case of farms and businesses, payment for actual expense and losses must be made or the owner can elect to take payment based upon past income. Under the latter, the minimum is $2,500.00 to a maximum of $10,000.00. Finally, a relocation assistance advisory service must be set up to assist owners and tenants to locate replacement homes, farms or businesses as the case may be. How does this compare with prior navy procedures?

Previously, navy could only reimburse former owners and tenants for actual costs for searching for and moving to a replacement property. None of the other payments previously mentioned were required.

The second part of the act involves acquisition procedures. Under prior navy procedures, appraisals were made on the property to be acquired. Negotiations with the owner were then based upon those appraisals, but the owner was not informed as to the amount of the appraisal nor was there a requirement that initial offers had to be at least equal to the appraisal value. Also it was possible to condemn the property to get immediate possession. Now it is required under the act that the property to be acquired must first be appraised and the owner shall be given an opportunity to accompany the appraiser during the inspection of the property. The initial offer cannot be less than the navy's approved appraisal and the owner must be given a written summary of the appraisal figures.

The act states that every effort will be made to acquire real property by negotiations. This means that offers cannot be made on a "take it or leave it" basis. There must be a serious effort to resolve differences of opinion as to the value of the property through negotiations. As to obtaining possession of the property, the act requires a ninety day written notice to vacate. This notice cannot be given until title to the property passes to the government either by direct purchase through negotiations or by condemnation.

In summary, the passage of the Uniform Relocation Assistance and Land Acquisition Policies Act of 1970 makes it essential that detailed and timely planning go into every proposal to acquire private property for navy projects.

Real Property Inventory

By WILLIAM G. LANTERMAN

• Alexandria, Va.

The Real Property Inventory (RPI), first automated in the early 1950s, reflected the 1950 "state of the art" of automation — it required tedious, time-consuming input by activity personnel and laborious review by the APWOs/DPWOs (the EFDs of yesteryear).

In the 1950s, the RPI was not fully recognized as a management tool. Laborious RPI tasks were accorded low priorities by many activities. Inaccurate and untimely data input required an inordinate review effort by our field divisions.

The Navy Facilities System (NFS) is changing the picture. The RPI is the base for developing Navy Facilities Assets (NFA) data. NFA/RPI data are prerequisites of several of the NFS management subsystems (e.g., planning/construction/maintenance). Throughout the Navy, management at all levels now recognizes that RPI timeliness and accuracy drastically impacts their MCON and maintenance budgets, and has important interfaces with other management systems.

To satisfy NFS requirements, the RPI, in 1970/71, was redesigned and its data base installed in the Facilities Systems Office (FACSO) at NCBC, Port Hueneme. The redesigned system and its relocated data base became operational in January 1971.

The new RPI design was accomplished by a team of functional (FAC 07) and ADP (FAC 011 and FACSO) personnel. It was fully coordinated with other codes to insure optimum interfacing with other NFS integrated subsystems.

The new RPI has: significantly minimized activity data input effort, eliminated need for EFD review, reduced "turn-around time" (activity data transmittal to activity receipt of FACSO data output), and provided an effective continuing reconciliation of RPI with NAVCOMPT fiscal reports.

With the realization that the accuracy and timeliness of RPI data can affect their funding and with the visibility of recent RPI improvements, RPI tasks are being accorded higher priorities at the activities — the prime source of accurate RPI data input.

Military Preference Housing

BY WILLIAM L. HOWARD

• Alexandria, Va.

Section 236 MPH (Military Preference Housing) of the National Housing Act is a joint effort of DOD and HUD to provide low and moderate income military families with housing that they can afford in the private community. The navy was the lead service in sponsoring this program.

Under Section 236 authority, HUD pays an interest subsidy of the difference between mortgage payments based upon one percent interest and mortgage payments based upon prevailing market interest rate. This interest subsidy lowers rental rates to a level that low to moderate income families can afford.

The demand for rental family housing built under the Section 236 program far exceeded the supply and it was soon determined that, due to frequent reassignment, military families could not compete with civilian families for occupancy. To correct this inequity, an amendment to the National Housing Act of 1970, was enacted on December 31, 1970, authorizing HUD to set aside a specific number of Section 236 units each year for priority occupancy by military families.

In 1971 the Navy Department was allocated a total of 1706 Section 236 MPH units at six locations; in 1972 an additional 1950 units at eleven locations and has requested approximately 2200 units at 22 for 1973.

Military personnel are eligible if the head of the family or the spouse can be expected to remain in the area for one year, and the adjusted family income as defined by HUD does not exceed 135% of the local housing authority income limits for low-rent public housing.

Rental rates are based upon 25% of his adjusted family income or the "basic rent", whichever is the greater, but in no event more than the "fair market rent". If the local income limits are exceeded, applicants can be accepted but will pay the fair market rent. If 25% of the tenant's income is less than the basic rent, he may be eligible for Rent Supplement Assistance.

Section 236 is privately-owned housing that is constructed and operated with private capital and is an integral element in the navy family housing effort. No navy funds are involved.

Memorial Fund for CE1 Brundrette

• Washington, D.C.

A memorial fund has been established for CE1 R. E. Brundrette Jr., who was killed in a traffic accident at Vung Tau, RVN, on 1 December 1972. Friends may make contributions to the Seabee Memorial Fund in Seabee Brundrette's name.

Known as "REB" to his friends, Seabee Brundrette joined the navy in 1967 as a CE1 through the Direct Procurement Program. He had been a practicing electrician, licensed in the State of Massachusetts, for some 13 years before joining the Seabees.

At the time of his death he was serving as Assistant Utilities Officer for Commander Naval Forces Vietnam.

He leaves a wife, a son and two daughters.

Send donations in Seabee Brundrette's name to: Seabee Memorial Association Inc., Post Office Box 19383, Washington, D.C. 20036.

Field Activities

RPG Facility at Point Mugu

• Point Mugu, Calif.

A West Coast radioisotope power generator surveillance facility was recently established at Point Mugu. It is currently the only activity of its kind in the navy and will serve to receive, store, perform minor adjustment and repair work, and monitor radioisotope power generators (RPGs) on the west coast. A second facility is to be established at the Navy Nuclear Power Unit, Fort Belvoir, Va., in the near future as the East coast facility.

The U. S. Navy is the leader in RPG development and has found a number of applications for these units, ranging from satellite applications to underwater navigational aids.

The generators are totally silent and extremely dependable. Depending upon their design they can produce from less than 1 watt to 100 watts of electrical power. The units can be safely used in any environment from the vacuum of outer space to the depths of the sea.

Because of its leadership in the field of RPGs, the navy is currently the only holder of a broad license from the Atomic Energy Commission that allows it to operate, manage and control the use of RPGs.

Current navy users of RPGs on the west coast include the Pacific Missile Range which operates an RPG powered automatic weather station on remote San Miguel Island, and underwater navigational aids in the mid-Pacific area; and the Navy Undersea Center at San Diego.

East Coast users of RPGs are the Naval Underwater Systems Center at New London, Connecticut and the Naval Coastal Systems Laboratory at Panama City, Florida.

Ammo Pier Delay at Sella Bay

By RICHARD STINSON

• Alexandria, Va.

Sella Bay, Guam sees the first light of America's day on the horizon of the Philippine Sea. On 26 October 1970 Congress approved Navy acquisition of 3,920 acres of land for the Guam Ammunition Pier project at this site. $946,000 was subsequently funded for that project.

Of the land proposed for acquisition, 2,777 acres are owned by the Government of Guam. The remaining parcels are owned privately by approximately 100 individual parties. Since authorization, Guam has experienced a period of unprecedented growth and flourishing land speculation. The increase in land values was revealed by recent independent land appraisals which indicated a value of $5,117,000. Amended congressional authorization now provides purchase authority up to $5,116,000. No increase in the appropriations was requested in the FY-73 program, in light of the decision to use land exchange to the maximum extent.

An agreement of exchange between the Government of Guam and the Navy was negotiated by the NAVFAC Real Property Management staff and executed on 26 April 1972. The Guamanian government agreed to transfer the pier site and access road right of way and to grant an easement for a blast safety zone over remaining portions of land radiating from the pier site. In exchange, the United States will transfer land at NAS Agana and Cabres Island, lease lands in the Massa Reservoir area, and execute a Joint Use Agreement for airport facilities at NAS Agana. Additionally, the privately owned sites to be acquired in the blast safety zone will be leased to the Government of Guam for nominal consideration for conservation purposes and recreation when ammo loading permits.

However, certain objections by the Guamanian legislature and legal actions by ecology and conservation factions have delayed acquisition of the land needed for the ammunition loading pier at Sella Bay.

To date no Government of Guam land has actually been acquired nor has the existing exchange agreement been implemented except for certain rights of entry granted to th Guamanian Government. Further action awaits the outcome of the legal suits.

MUSEUM SOLICITS MEMENTOS

• Port Hueneme, Calif.

Construction of the new wing on the CEC/Seabee Museum in Port Hueneme is nearing completion.

The new wing consists of three pre-engineered buildings which have been modified to provide about 13,000 sq. ft. of floor space. Y. H. Ketels says that the wing will be used to display dioramas depicting the chronological history of the Civil Engineer Corps and Seabees.

At present, an insufficient amount of post-WWII memorabilia may temporarily damper the expansion plans. Ketels says he foresees no real problems resulting from this deficiency, if he can get some of that famous "Can Do" help.

"We're primarily interested in obtaining unusual items which men of the Naval Construction Force have obtained during their worldwide travels," said Ketels. As examples, he mentioned handmade tools, weapons, musical instruments, religious artifacts, cooking utensils, clothing, and art objects.

Ketels said that those who would like to donate items to the museum should contact him and, if possible, provide a photograph and measurements or a description of their donation. The address is:

Curator
CEC/Seabee Museum
USNCBC
Port Hueneme, CA 93043

FACSO COMES OF AGE

By VICTOR A. VELLA

• Port Hueneme, Calif.

The Naval Facilities Engineering Command Facilities Systems Office (FACSO) joined the big leagues with its acquisition of an IBM 360/65J on 9 October 1972. The new computer supplanted an overloaded IBM 360/50I on an interim basis, until replacement equipment can be competitively procured in FY '75. Substantiating the requirement for the equipment upgrade was a significant expenditure for commercial support which snowballed with the implementation of new applications and refinements to existing centralized systems at FACSO.

The IBM 360/65J has twice the core capacity as its predecessor and is potentially three to five times faster. The size and speed of the new machine required the addition of eight disk and eight tape drives to the configuration to realize its full capability. This enabled FACSO to reduce its seven day/three shift operation to a nominal five day/two shift schedule resulting in both time and cost benefits.

The transition from the IBM 360/50I to the IBM 360/65J was by no means an easy one. The installation was planned to insure a minimum of downtime during the changeover. The effort was compounded due to the multivendor environment at FACSO with no less than five vendor/contractors involved in the project. This demanded precise planning, coordination and execution throughout the entire operation.

Prior to the delivery of the IBM 360/65J, the computer room was completely rewired and the floors were shored to specifications. Components started to arrive at the FACSO ahead of schedule while the electrical power modifications and the floor work were still in process. The scene was somewhat reminiscent of a Cecil B. DeMille spectacular as a small army of electricians, carpenters, customer engineers, and vendors swarmed the computer room to the bewilderment of operations personnel stricken with temporary claustrophobia. A fair share of "sidewalk superintendents" freely dispersed their much valued advice.

Following a comprehensive series of hardware/software diagnostic runs, the new computer system went operational within eight days of its delivery. As of this writing, it is too early to determine the final performance level achievable with the IBM 360/65J. FACSO plans to sustain or better a 95 percent effectiveness level on a continuing basis. This is to be attained through on-site maintenance, frequent preventive maintenance outside of regular working hours, and a continuing effort at performance evaluation techniques aimed at improving the overall efficiency of its recently acquired and most valued brainchild.

LANTDIV Opens European Branch

By LCDR S. A. MARTINELLI, CEC, USN

• Norfolk, Va.

In response to the increased tempo of naval operations in the European area, as evidenced by both the forward deployment homeporting of additional ships in Europe and a general facilities upgrading effort, a European Branch of the Atlantic Division, Naval Facilities Engineering Command has been established in Naples, Italy. The director of the European Branch is Captain J. D. Rumble, who is also the OICC Spain, with offices in Madrid. The full time deputy director of the branch in Naples is LCDR S. A. Martinelli.

The principle geographic area of European Branch operations is that under the cognizance of the Commander-in-Chief U.S. Naval Forces Europe, which includes activities in Europe, Africa, and the Middle East. The major claimants for the activities concerned include CINCUSNAVEUR, COMNAVCOMM, COMNAVSECGRU, and BUMED.

The branch is tasked with providing major claimants, commands, and activities with technical advice and assistance in the total facilities engineering and management areas, with particular emphasis devoted to rendering timely professional assistance to the activities. Specific functions include: providing advice and assistance in public works management nad operations areas; consultation support in facilities planning and acquisition; coordination, preparation, and participation in special studies and projects; liaison and coordination in expediting support as necessary to meet facilities engineering requirements; and the review of all European area ESR submissions and the accomplishment of all those within branch capability, with the forwarding to LANTDIV with appropriate recommendations of all others.

The establishment of the European Branch has thus assisted greatly in providing responsive effective facilities assistance to U.S. Naval activities in Europe, and in bridging the distance between these activities and the Atlantic Division home office in Norfolk.

VALUE ENGINEERING ANALYSIS

By LINDSAY K. GARDNER, P.E.

• Norfolk, Va.

Rear Admiral A. W. Walton, Jr., Commander, Atlantic Division, Naval Facilities Engineering Command, Norfolk, Virginia, has announced total savings amounting to $8,808,000 as a direct result of implementing value engineering analysis to construction projects scheduled during fiscal year 1972.

Value engineering analysis is a systematic effort directed at analyzing the function of a construction project for the purpose of achieving an end product at the lowest overall cost to the government, consistent with the necessary requirements for performance, reliability, quality, and maintainability.

The FY '72 savings program, which ended on 30 June 1972, exceeded all previous activity efforts by $2,500,000, the culmination of intensified efforts over the past eight years to make the program a success. The Atlantic Division, Naval Facilities Engineering Command is responsible for design and construction of navy facilities in five CONUS states and is involved in developing projects in over 40 countries located on six continents. With the in-

creased emphasis on reducing expenditures in the Department of Defense, value engineering has become an increasingly important factor.

Some of the most noteworthy value engineering efforts, which had individual savings of $250,000 or more, include:

Electrical power improvements at the Norfolk Naval Shipyard, Portsmouth, Va.

Navy commissary store and runway extension, Naval Station, Keflavik, Iceland.

Installation of antenna towers at Madrid, Spain

Reindeer Station, Indian Ocean

Family housing, Camp Pendleton, Virginia Beach, Va.

Those conscientious employees making outstanding contributions to the success of the program include G. W. C. Brown, P. E.; N. A. Machara, P.E.; J. H. Butt, P.E.; C. M. Tennefoss, R.A.; S. W. Ferguson; R. L. Curfman, P.E.; K. A. Nothnagel, P.E.; W. M. Whitson, P.E.; L. E. Williams; of the LANTDIV Headquarters Office; and M. G. Dailey, P.E., of the Madrid, Spain, office. Numerous other employees contributed smaller but equally important inputs to help make the FY '72 Value Engineering program a success.

Instant Communication Formula

By LCDR G. E. FOWLER, CEC, USN

Construction Equipment Department
Naval Construction Battalion Center

• Port Hueneme, Calif.

Effective communications are just as important in an organization staffed primarily with civilian employees as in a military organization. Currently, in the environment of shrinking monetary resources, managers are being called upon to provide stable or increased production while the manpower available decreases. By striving to improve people-to-people communications throughout their organization managers can make a major stride towards meeting this challenge.

In the Construction Equipment Department (CED) at the Construction Battalion Center (CBCEN), Port Hueneme, an aggressive effort towards improved communications at all levels within the department has been underway for the past year.

Twice during the year, April and November, the department head personally presented a briefing to all employees in the department and attempted to answer questions that they desired to ask. Major underlying concepts germane to this effort are:

1. *Talk to all employees in a single day . . . this cuts down on the rumor factor.*
2. *Talk to groups of 20-25 persons . . . with a larger group you lose eye to eye contact.*
3. *Cover three areas . . . recent past, present, future . . . be candid, truthful, and above all be sincere.*
4. *Give the same basic information to everyone.*
5. *Be receptive to questions and either answer them immediately or provide the answer to the specific person at a later date.*

These sessions have opened direct communications between all employees and the department head, have improved communications between subordinates and supervisors and have created a better work environment by improving communications among peers.

Additionally, rumors have been stopped, stability has been added to the organization and everyone has become knowledgeable of and are more able to work toward the macro goals of the organization.

An open door policy by supervisors and a suggestion box (key is held by the department head) supplement this program of instant and direct communications throughout the organization on a daily basis.

Results?? . . . During the past year the CED has reduced its manpower by 29%, cut the customer cost per direct labor hour by 24% while production has remained essentially stable. More effective communicaitons may not have been the only factor in achieving this record . . . but it was certainly a major one.

Try it!!! . . . *they'll like it!*

Seabees

NMCB STATUS REPORT

By LCDR J. D. PENSYL, CEC, USN

Seabee Capabilities Branch Head
Headquarters, NAVFAC

• Alexandria, Va.

General Douglas MacArthur's statement that "the only trouble with the Seabees is that we don't have enough of them" was never more true than it is today. As 1973 dawns, Seabee assets are at a premium. Tasked to the absolute limit, there just simply are not enough Seabees to satisfy existing and projected requirements.

Faced with a backlog of work amounting to more than two years, the ten Naval Mobile Construction Battalions (NMCBs) are spread throughout the world, busily engaged in a variety of operational and habitability improvement projects.

The number one priority project remains the construction of an austere communications station on the island of Diego Garcia in the middle of the Indian Ocean. Started in March 1971 by NMCB 40, continued by NMCB 1 and now by NMCB 62, the station is scheduled to be operational in March 1973, although completion of all presently assigned work will require another year and a half. NMCB 62 will complete the airfield paving as well as many other facilities before being relieved by NMCB 74 in March 1973.

Providing a 155-man augment to the battalion at Diego Garcia is NMCB 133 whose main body is located at Rota, Spain, constructing base facilities. In addition, NMCB 133 has details constructing facilities at Sigonella, Sicily; Naples, Italy; Nea Makri, Greece; Souda Bay, Crete; and a Seabee Team at Kusaie, TTPI.

Demonstrating the actuality of the total force concept, NMCB 4, a Port Hueneme homeported battalion, is employed at Roosevelt Roads, Puerto Rico, as the Atlantic fleet alert battalion. As with the Rota battalion, NMCB 4 is spread out with details at Guantanamo Bay, Cuba; Balboa, Canal Zone; and Bermuda with Seabee Teams at Yap and Palau in the Caroline Islands, Trust Territories, Pacific Islands (TTPI). NMCB 4's priority job is construction of a navy telecommunications center which is being driven by extremely tight completion dates to meet operational requirements. NMCB 4 should essentially complete this facility before being relieved in May by NMCB 10.

In the other ocean, NMCB 3 is serving as the Pacific fleet alert battalion on Okinawa with details at Iwakuni, Japan; Taipei, Taiwan; Cubi Point in the Philippines; and Guam, and Seabee Teams at Truk and Ponape, TTPI. NMCB 3 relieved NMCB5 in December, the latter battalion having mounted out during their deployment in total

to provide contingency construction at Nam Phong, Thailand, the first such mount out since NMCB 10 led off the procession of NMCBs to Vietnam in May 1965.

NMCB 1 which relieved NMCB 40 on Guam in early February 1973 continues work toward completion of the Seabees' new camp, Camp Covington. Before they left, NMCB 40's Detail Luzon completed the relocation of 49 family housing units from Sangley to Subic, a project begun in July 1971 by NMCB 5.

Rounding out NMCB activity, NMCB 71, a half strength battalion devoted almost exclusively to the "ice", is engaged in the construction of a new South Pole Station, completion of new facilities at Siple Station and other construction projects at McMurdo Station, Antarctica.

Five Seabee Teams continue to provide civic action assistance at Ponape, Truk, Palau, Kusaie and Yap (TTPI). Last summer, however, a Seabee Team from NMCB 74 with assistance from PHIBCB TWO, assembled an Ammi pontoon hospital barge on Lake Titicaca high in the central plateau of Bolivia, demonstrating the variety of projects and locations which beckon the Seabees.

Seabees Aid Quake Cleanup

• Managua, Nicaragua

On Jan. 3, a small team of U.S. Navy Seabees were deployed to earthquake-riddled Managua, to recover as much as possible of the classified equipment and materials from the rubble of what was once the U.S. Embassy. The four-man team from the State Department's Naval Support Unit in Washington, D.C. made quick work of what was originally estimated to be a three to four week job. Within nine days, all of the equipment had been retrieved. Upon completion of that mission the team retrieved the major portion of the remaining office furniture and equipment from the wreckage.

Following the work at the embassy, at the express request of Hope Somoza, wife of Nicaraguan President Anastasio Somoza, through the U.S. Ambassador to Nicaragua, the Navy Construction Team proceeded to Managua's El Retiro Hospital for a similar job. They immediately employed their technical expertise and equipment to recover the valuable operating room and surgical gear from the remains of the big hospital. Recovery of this equipment not only saved the hospital substantial money but also enabled it to be used in the much needed medical treatment of the earthquake victims. The team departed Nicaragua on Jan. 18.

Use of this team provided another example of the varied talents of the U.S. Navy's Seabees who are almost as well known for their humanitarian accomplishments as their combat construction feats.

NMCB-1 Wins Peltier Award

• Davisville, R. I.

In recognition of outstanding performance, the Society of American Military Engineers (SAME) has announced that NMCB-1 has been selected as the "Best of Type" in both the Atlantic and Pacific Fleets and will be presented with the Peltier Award for 1972.

Named for Rear Admiral Eugene J. Peltier, former Chief of the Bureau of Yards and Docks and the Chief of Navy Civil Engineers, and a past president of SAME, the awards is presented annually in the form of a plaque to the Naval Mobile Construction Battalion selected as the most outstanding during the fiscal year.

The award went to NMCB-1 for their sustained superior professional and military proficiency during their deployment to Diego Garcia.

Arriving in Diego Garcia on 20 November 1971, NMCB-1 was faced with a massive horizontal and vertical construction effort. For seven months, the 700-man battalion coped with heavy tropical rains, high temperatures and humidity while working a ten-hour day, six days a week, to build a permanent Naval Communications Station on that remote island.

Working on some 41 separate projects, the Seabees continued work on an operational airfield; a network of roads; erected utility lines and cement silos; installed underground water lines as part of the overall facility; and put in considerable foundation work.

NMCB-1 was under the command of Commander Philip Oliver, Jr., CEC, USN, during Fiscal Year 1972.

Seabee Reserves

Reserve Readiness Advanced

By CDR F. G. KELLEY, CEC, USN

Head, Reserve Program Branch
Headquarters, NAVFAC

• Alexandria, Va.

In his memorandum of 21 August 1970, the Secretary of Defense specified that the readiness of the guard and reserve forces should be upgraded to allow them to become the initial and primary source for augmenting active forces in the event of a limited or general war.

In response to this memorandum efforts have been made to elevate the readiness posture of the 10,000-man Reserve Seabee Force through a variety of programs. Rear Admiral George Reider, Commander, First Reserve Naval Construction Brigade, has, over the past two and a half years, through innovative techniques, implemented new procedures within the RNCF that have advanced the Reserve Seabees to the forefront in Naval Reserve readiness.

One such program involves the establishment of Permanent Drill Sites (PDSs) for RNMCBs at military installations within their respective geographical areas which will serve as the permanent headquarters for RNMCBs.

At these PDSs there will be positioned Readiness Support Allowances (RSAs), valued at $700,000 each. Each RSA consists of essentially a 10% cross-section of a P-25 (the Advanced Base Functional Component for a Seabee Battalion). These RSAs will allow battalions to develop year-round training programs. Thus far allowances have been shipped to nine RNMCBs, three additional allowances will be shipped this fiscal year, with the remaining six allowances scheduled to be shipped in FY-74.

In order to effectively care for and utilize RSAs, active duty support personnel are being provided to each of the RNMCBs. A battalion will receive five Group VIII petty officers who will be assigned to the Permanent Drill Site. There are also plans for additional active duty support, both officer and enlisted, for the Reserve Naval Construction Force. These programs are under development by Commander, Naval Facilities Engineering Command; Commander, Naval Surface Reserve, and Commander, First Reserve Naval Construction Brigade.

The mobilization readiness level of the Reserve Naval Construction Force has been improved substantially over the past two years. With the readiness improvement programs mentioned above and the additional emphasis being placed on recruiting, the Reserve Seabeas will soon be able to stand side-by-side with their active duty counterparts to provide for the security of our country.

RDT&E HELP IN A HURRY

By D. OLSON

• Alexandria, Va.

Local field activities encounter a wealth of new products and techniques. Often questions arise as to their relative value and suitability because of the lack of technical data, experience, or records. To help solve this problem, NAVFAC "earmarks" approximately $200,000 to the Navy Civil Engineering Laboratory (NCEL) every year for direct support of field problems. This service is available at NCEL's facilities engineering support office without charge to EFDs, PWCs, PWDs, OICCs, ROICCs, and civil engineer staff officers, worldwide.

Quick response is the name of the game. Over 60 percent of all requests are answered within 14 days! Take the case of NAVFAC's Western Division who recently requested information about a new type detergent for degreasing and cleaning of fuel tanks. NCEL had tested a number of similar products and used laboratory analysis to initially evaluate the detergent. Within 10 days, funds were forwarded to WESTDIV for field testing by a contractor who was cleaning and coating fuel tanks at NSA Seattle.

NCEL witnessed the actual tests and will publish the results in a technical data sheet. Other typical services include:

• Determining causes of failures and recommending protective coating systems for buildings, towers, storage tanks, waterfront structures and underpier piping, and for marking airfield pavements.

• Analyzing and evaluating existing/proposed systems systems for protecting moorings; destroying classified materials; handling and disposing of sewage and oily and solid waste.

• Identifying products of corrosion and build-up in fresh and salt water systems and recommend preventive action.

• Providing on-site assistance when required.

Requests for assistance should be submitted, by any means, to NCEL, Attention: *Facilities Engineering Support Office (Gene Early, Code L03C). Calls are received anytime on Autovon 360-4070 or commercial, 805-982-4070.*

NCEL Tests 3ph Power Monitor

• Port Hueneme, Calif.

A new electric power monitor, which may appreciably reduce costs of "down time" of computers and communications centers, is undergoing testing and evaluation at the Navy Civil Engineering Laboratory (NCEL).

Six improved models of a unique 3-phase power system monitor, developed by NCEL, have been built under contract. Following final acceptance, the six units will be used by the Naval Communications Command for COMNAVCOMM equipment.

Until now, no comprehensive and economical power monitor had been developed for 3-phase power systems. Regulation and monitoring of electric power has been a problem of continuous concern. The NCEL monitor, for the first time, takes the guesswork out of trying to pinpoint power disturbances to equipment malfunction or source fluctuations.

Maurice N. Smith, developer of the concept, said it is vital to know the type of power deviations. Repetitive pulse transients (momentary deviations from desired line voltage) can physically endanger a computer system. A fraction-of-a-second disturbance, such as created by a drop in voltage lasting 5-10 cycles, could put a computer out of operation for more than an hour. However, in many instances, internal protective devices are provided to automatically shut down the computer to prevent loss of its memory.

The monitor detects overfrequency, underfrequency, overvoltage, undervoltage, and impulse voltage transients on all three phases of supply. Detection of selected conditions is logged on corresponding electromechanical counters and on a time-and-event printout recorder. The monitor also has audio (buzzer) and visual (colored lights) warning devices. Another feature is that the unit can operate unattended for extended periods of time.

When mass produced, the monitors developed by NCEL hopefully would cost less than $3,000 each.

Undersea Blast Effects on Fish

By LCDR JAMES P. WATSON, CEC, USN

• Norfolk, Va.

A recent Navy construction project on a small island off the eastern coast of Puerto Rico required blasting of several underwater obstacles to clear a channel for landing craft. The prolificacy of marine life in these tropic waters prompted a detailed assessment of the environmental impact of the proposed blasting.

In preparation of the environmental impact statement, it was found that very little information was available concerning damage to marine fauna by underwater blasting. The most comprehensive reference material found was an article in the *California Fish & Game,* Volume 38, Number 3 of July 1952. That article reported on experiments near LaJolla, California, utilizing dynamite and in the Chesapeake Bay, utilizing black powder. It concluded that most fish would be killed by an overpressure of 40-70 PSI when using dynamite or equivalent rapid detonation explosives.

From the U.S. Navy diver's manual, the formula

$$P = \frac{13{,}000}{D}(W)^{1/3}$$

is given to predict overpressure from underwater explosions. (P = pressure in PSI, D = distance in feet, and W = weight of explosives in lbs.)

To confirm the conclusions reached in the environmental impact statement, a research project was initiated to record the peak pressures at various distances from the blast and observe the effect on several fish specimens in cages near the recorders. The largest blast was 2100 pounds of C-4 explosives detonated by UDT divers near the bottom, in 15 feet of water. It was found that the venting of the gas bubble to the surface results in drastic reduction in the horizontal propagation of the shock/pressure wave. At 1050 feet from the largest blast, a peak pressure of 9.15 PSI was recorded, where a predicted pressure of 159 PSI was calculated. Fish in a cage only 450 feet from this blast were not killed. The entire blasting operation, three detonations totaling 4000 pounds of explosives, killed only 60 fish representing 14 families and weighing a total of 25 pounds.

The results of the research were not adequate for determining a formula for predicting overpressures when the explosion gas bubble is vented to the surface. However, it was proven that the U. S. Navy Diver's Manual formula for overpressure is not applicable for blasting in shallow water when the gas bubble will vent. Additional information on this subject is available from the Environmental Protection Coordination Office, Atlantic Division, Naval Facilities Engineering Command, Norfolk, Virginia 23511.

Marine Borer Named for NCEL

• Port Hueneme, Calif.

A new species of deep-water marine borer has been named after the Naval Civil Engineering Laboratory, which discovered the rare mollusk at 6,000 feet.

The borer was given the scientific name of *naceli* by Dr. Ruth D. Turner, international expert on marine borers, Museum of Comparative Zoology, Harvard University. The species *naceli* was placed in a newly-created genus *Xyloredo* by Dr. Turner who revealed the new species and genus in a paper published in a recent scientific journal.

The *Xyloredo naceli* is a bivalve mollusk related to the family of oysters, clams and mussels. It is a member of the family of *Pholadidae*. The *naceli* was found on an NCEL Submersible Test Unit (STU), one in a series of devices with a variety of test specimens emplaced in the ocean for as long as two years.

Laboratory senior research biologist James Muraoka said the strange borer displayed unique characteristics which led to Dr. Turner forming the new classificaiton. The mollusk resembles, in part, the genus *Teredo* and genus *Xylophaga*. It has the head of *Xylophaga* but the *Teredo* body which secretes a calcareous film along the tunnel it bores in wood. Six such mollusks (¼ inches in diameter) were found in panels of Douglas fir wood attached to the STU upon recovery from the ocean floor 80 miles off the Ventura County coastline.

Dr. Turner, addressing the Third International Congress on Marine Corrosion and Fouling, announced that a second unclassified marine borer, discovered during NCEL STU operations, would be named after Muraoka. The name will be revealed in a pending Dr. Turner scientific paper.

Professional Development

CAREERS: Planned or Gambled

By W. H. BOYLE

"Must helpless man, in ignorance sedate;

Roll darkling down the torrent of his fate"

• Alexandria, Va.

Samuel Johnson might well have had in mind the careering or careening that describes the course followed by many civil service employees in completing relatively long years of employment with one or a number of Uncle Sam's agencies. Review of employee records at the end of a life's work frequently shows that the jobs held were strung together by chance rather than any identifiable plan or pattern. Any building-block relationship of these jobs is usually non-existent. This may be a tribute to the versatility of individuals or a condemnation of organizations for "making do" with marginally qualified employees. Many employees assume that successful and rewarding service, and self-service, is directly related to the number of applications kept working among possibilities elsewhere, and maintenance of a constant "ear to the ground" on what's going on in other organizations. This focus on the outside does little to foster identification of the employee's goals with those of the organization. This lack of identity makes losers of both parties, the employee and the organization.

There are alternate approaches, which can take some of the haphazardness out of building a career within civil service. An integrated career staffing approach is one way. It is important to note that no plan can guarantee the employer's fulfillment when he must compete in a seller's market for the skills and abilities he needs. Similarly, no panacea exists which provides guaranteed progression to the employee in a labor market not requiring the skills and abilities he offers. The law of supply and demand is as applicable in the staffing of organizations as it is to the manufacture and sale of products.

Integrated staffing implies the introduction of order to employee input, initial orientation and training, and continuing development. Casual replacement actions give way to planned input and budgeting for a specified number of trainees at entrance levels. Orientation and initial assignment and development patterns for this career group normally develop its member's viewpoints beyond a single activity. Command or an agency-wide support for an integrated staffing approach can guarantee consideration of the employee for opportunities for which he has appropriate qualifications, and can provide selecting officials with a wider base of qualified candidates to draw from.

Providing continual input based upon estimates of needs over a future period; enabling developmental opportunity through applicable academic or professional courses, planned short-term and long-term assignments; and establishing a central inventory for referring candidates for key-level positions make up the framework upon which integrated career staffing is built. This is the essence of career management.

Career management framework exists in the NAVFAC organization. The NAVFAC Professional Development Center provides continuing planned input of college graduates with specialized academic attainments. On any given day throughout NAVFAC, 150-180 young professionals are undergoing development through educational courses, rotational assignment, and on-the-job training designed to move them into full performance level positions in two to three years. The NAVFAC Facilities Engineering Career Plan (NAVFACINST 12950.1 of 14 March 1972), covering engineering and scientific employees, lists training and assignment guides best calculated to provide practicable technical, professional, and management development from trainee through senior levels. These guides are by functional area (planning, design, construction, maintenance and operations) and are the products of consideration of experienced functional experts. The central inventory system which will be used for GS-14 and GS-15 will be included as part of the inventory of all Navy Engineers and Scientists.

Unless there is commitment to go along with it, career management may be nothing more than a collection of pages or a pamphlet to be removed from the shelf to discuss with, and perhaps to impress, visitors. Commitment means that the organization must provide the resources, money and time, to support the educational and training activities that mark the developmental features of a career staffing program. The employee must commit his or her time both on the job and off the job to do justice to self-development activities. Some monetary investment may also be expected on the part of the employee.

NAVFAC has committed funds to career management through the Command Management Plan. Headquarters and EFDs have been provided with sufficient resources to advance career development and training goals. A concerted approach on the part of supervisors and employees is now in order to remove past skepticisms regarding career programs. Existing career programs cover positions in procurement, supply management, quality and reliability assurance, civilian personnel, and facilities engineering.

The benefits of career management and planning do not accrue to individuals, or employers, overnight. They are measurable over a period of years. For the employee the benefits are reckoned in planned development opportunities with related growth in responsibilities, the confidence engendered by increased qualifications for job performance, and participation in development of plans which can build his own career. For the command the benefits are increased professionalism of staff, availability of greater numbers of eligibles ready to succeed to key positions, improvement in age balance in the workforce, and increased quality of services it provides to navy.

NAVFAC will not be venturing in new areas by putting into practice many of the elements of career management previously mentioned. The current emphasis offers a broader application of and coordination of personnel management practices with budgeting and manpower management to ensure increased returns from the investment to individuals and the organization.

Career management offers an opportunity to each individual to plan and carry out a continuing program of professional growth throughout his or her professional career. His or her use of the available opportunities is the employee's own responsibility. Supervisors should encourage and counsel employees in this planning process. As a minimum, employees should complete the Individual Development Form applicable to the existing career programs to define goals and plans for discussion with supervisors. This initial step gains combined participation and starts the process which sets career management in motion. The Individual Development Form included as Appendix 1 of the Facilities Engineering Career Plan is appropriate for personnel covered by that plan and can effectively be used for all other individuals not covered by specific programs. This form, with a sample illustration, developed through hypothetical discussion of an employee and a supervisor engaged in planning activities is shown as Figure 1. When prepared by the employee and his supervisor, and approved at a higher level, this form, with other similar forms from the total organization, provides the basis for developing the annual training plan. the NAVFAC Facilities Engineering Civilian Career Plan should be used as a guide to the types of courses and assignments which can be most meaningful to the engineering employee in fostering his development along functional and/or managerial career pathways. It establishes patterns which can be followed with local discretion, in building plans for employees in other fields.

Career management counseling is a continuous process. In addition to the supervisor, personnel specialists, and ideally, a recognized senior employee with wide organizational knowledge can be helpful contributors in steering the employee into appropriate and practicable career pathways. Formal developmental counseling should take place at least annually. It should be completed prior to the development of the activity's annual training plan. The employee should be prepared for the meeting by giving real thought to his work performance and his career objectives, both short-range and long-range; the assets he offers for pursuit of those objectives; and the areas where personal improvement and strengthening is required. Admittedly, these are difficult assessments for the individual to make. In numbers of cases, employees' aspirations may be too wide off the mark to offer possibility of achievement, and the counsel of the supervisor and others who can contribute becomes important in developing achievable goals. Supervisors must guide employees in evolving plans geared to improving performance, and preparing employees for more responsible work. It will take some of the wisdom of Solomon to work out employee aims and simultaneously consider the present and future needs of the organization. It goes without saying that supervisors must assure themselves that development steps approved are justified in terms of the time and money involved. They must also see that plans once approved can be completed. The employee must be capable of using effectively what can be gained from the training, be it academic or a special assignment. Criteria too must be developed and applied at activity and higher levels to determine priority for approving nominees for the more costly types of training involving long-term courses and fellowships.

Over a period of time, we should have reasonable evidence that NAVFAC people can build their careers and exercise enough control of their own progress to dispel any feeling that they must be carried along by the torrents of fate. If the system is creditable, we will make winners of both the employees and the organization.

Postgraduate Program for CEC Officers

By LT G. F. EVERHART, CEC, USN

• Arlington, Va.

As the technological and managerial requirements of many CEC billets have advanced, so have the requirements for advanced education on the part of the officers filling those billets. In order to assure sufficient numbers of officers with the appropriate educational backgrounds, the Civil Engineer Corps is annually allotted quotas for postgraduate school. The actual number of quotas each year is determined through the use of a mathematical model based on several parameters, including the number of billets requiring assignment of officers with advanced degrees, and the number of CEC officers already possessing the requisite degrees. Approximately 70% of our quotas are for technical curricula; that is, civil, mechanical, electrical, nuclear power and petroleum engineering. The remaining 30% are in the various management fields, such as computer systems management, financial management and navy management.

Not only does the postgraduate program serve to fulfill the educational needs of the Civil Engineer Corps, but the program has a very real impact on the retention of CEC officers. The opportunity to attend PG school has proven to be one of the most popular "career motivation" programs available to CEC officers. The CEC is expected to continue receiving between 60 and 80 PG school quotas annually for the foreseeable future. Since this number exceeds the average size of year groups entering the LCdr.

selection zone, it can be seen that the opportunities for PG training are very good, indeed, for qualified career CEC officers. Since 1964, the proportion of CEC officers (excluding LDO's and warrant officers) holding master's degrees has increased from 19% to 42%. At the present time, approximately 1% of CEC officers now have or are in the process of obtaining doctorate degrees.

Of interest to most CEC officers are the criteria used by the members of the PG School Selection Board in selecting individuals for the program. The board convenes annually in August for a period of about one month. In an average year, over 300 CEC officers will apply for PG school. Each applicant's record is initially screened to determine whether minimum academic and performance standards have been met. At this point, the procedure may vary slightly from year to year, depending on the preferences of the board members. Basically, however, each officer who survives the initial screening is then considered for his first choice of curriculum, as indicated on his PG preference card. After every applicant has been considered for his first choice, those not selected are then considered for their second choices and, if necessary, for their third choices. In the likely event that the initial number of "selectees" exceeds the number ultimately to be selected, additional screening of records occurs, gradually reducing the list of selectees to the final number. At the same time, decisions are made concerning which officers will be principal selectees and which will be alternates. (There may be as many as two alternates selected for each quota.)

Generally speaking, officers with one to seven years of service are selected for the technical curricula and officers with six to ten years of service are selected for the non-technical (management) curricula. These year group criteria serve only as guidelines to the board members. They are not rigid rules. A particularly deserving officer may be selected for a curriculum not normally associated with his year group. Similarly, a dearth of well-qualified officers for a particular curriculum may necessitate selection of someone normally considered either too junior or too senior for that particular selection. For the same reasons, selection boards may select an officer for a second master's degree, although such selection is relatively infrequent.

As soon as the selection process is officially completed, a determination is made as to which principal selectees will actually be available for school during the following fiscal year. Those principals not available are "banked" for attendance in future fiscal years. Those who are to attend school (including alternates picked to replace bankees) are then requested to select three schools in order of preference, and to submit copies of their undergraduate transcripts to NAVFACENGCOM Code 09M11B, who then informally screens each selectee through his first choice of schools to determine the probability of admission. If the response is favorable, the officer is then told to apply formally just as any civilian applicant would.

In those cases where the first choice school cannot furnish a favorable response, the process is repeated with the second, and, if necessary, third choices of schools. A few curricula are offered at only one school each. However, an officer can, in most cases, attend a school of his choice, provided that a suitable program exists at that school.

Although officers are selected for specific fields of study, they are given wide latitude in the actual choice of courses. Each school has certain course requirements which, of course, must be observed. Electives should be chosen to provide that the individuals' education is developed in a manner which insures full development of his potential. While the students' faculty advisors are in the best positions to recommend specific electives, officers in technical curricula are strongly encouraged to choose as many management electives as practicable.

It has not been the intent of the author to present herein a detailed description of the postgraduate program. Those officers desiring more specific information concerning the program should refer to NAVFACNOTE 1520 or write to Commander, Naval Facilities Engineering Command (Code 09M11B), Washington, D.C. 20390.

A VANISHING BREED

By MORRIS GEWIRTZ

• Alexandria, Va.

About 30 years ago the need was recognized for the type of staff individual who could help a manager analyze the structure of an organization, review its methods and procedures, study its staffing patterns and recommend more effective and efficient ways to operate. Personnel hired for this service were generally titled Organization and Methods Examiners (O&ME). Their contribution to management was quickly recognized, and the O&ME was in great demand. After some interim title changes, the O&ME came to be called a management analyst (MA). The work required a high order of analytical ability combined with a comprehensive knowledge of (a) the functions, processes, and principles of management; and (b) methods used to gather, analyze, and evaluate information concerning the management process.

The rapid development of the computer and its application to management problems induced the growth of positions in the field of systems analysis and operations research which attracted much the same kind of analytical talent embodied in the management analyst. Attention was redirected from the skills of the MA to those of the computer specialist, systems analyst, or operations research analyst. In addition, management tended to use the versatile talents of the MA to deal with other administrative crash problems such as compilation of urgent reports, relocation of office areas or preparation of statistical presentations for which no other manpower was available. Organization and manpower utilization were neglected, while procedural systems were computerized and delegated to the computer specialist or systems analyst. Finding a qualified MA equipped to handle organizational and procedural problems has thus become more and more difficult.

The executive who runs a large organization should realize that the MA has major areas of work or study which are outside the realm of others who deal in a specialized way with the problems of management. He should appreciate that the MA can contribute much toward the solution of complex management difficulties involving people. By demanding professional output from his MA, and giving him the opportunity to produce it, the executive will go a long way toward easing his own administrative burdens.

Economic Analysis Course

By ENS KENNETH M. SHACHMUT, CEC, USNR

• Alexandria, Va.

Increasing fiscal pressures within the navy establishment today make the job of the resource manager more crucial than ever before. The watchwords "Do more with less" constitute much more than merely another catchy phrase, they are in fact a succinct statement of fiscal reality. Financial decision-makers at all levels of authority are being

called upon to justify their resource allocation decisions as cost-effective.

While at first glance this new constraint may seem unnecessarily burdensome, upon reflection the prudent individual will recognize that it is both proper and essential to effective resource management. Consistent with this philosophy, Congress and the Department of Defense place strong emphasis on sound economic justification for Navy MILCON investments. NAVFAC has answered this requirement with its economic analysis program. Recognizing that it is not sufficient to promulgate doctrine in a new field, the CECOS staff together with the NAVFAC Systems Analysis Division (Code 203) has developed a very strong curriculum in the field of economic analysis.

The major vehicle of this curriculum is a one-week course in economic analysis designed to provide field activity personnel with the understanding necessary to prepare and/or review analyses. Course work is about evenly divided between formal lectures and small student workshop-seminar sessions. Topics covered in the course include: techniques of economic analysis, discussion of relevant instructions, accounting principles, probability and statistics, cost analysis, the cost of capital, uncertainty and sensitivity analysis, modelling techniques, qualitative analysis, and preparation and review responsibilities. The course currently is being offered twice per quarter with 25 students attending each offering.

Currently, "economic analysis" is a "buzz word", and as such, is the subject of much discussion, both in the field and at Washington, D.C. Out of the confusion that inevitably attends such phenomena, the CECOS course offerings stand as beacons to light the way to understanding.

Note: Inquiries regarding attendance should be addressed to:

CAPT CHARLES M. HOWE, CEC, USN
Commanding Officer
Naval School, CEC Officers (CECOS)
Port Hueneme, California 93043

The CEC College Program

By LT EDWARD J. LOWERY, JR.

• Alexandria, Va.

For the last several years, NAVFAC has sponsored an annual college program aimed at projecting the professional image of the Civil Engineer Corps. This program has three main objectives:

(1) To emphasize the engineering and professional competence of the CEC.

(2) To provide the opportunity for the exchange of professional knowledge and to promote the profession of engineering.

(3) To acquaint the graduating college student with the CEC and the career opportunities it affords.

This program is executed by each of the Engineering Field Divisions, where a CEC officer is appointed as the College Program Officer with the responsibility for administering the College Program within the EFD's geographical area. During the academic year, each College Program Officer contacts the universities/colleges with accredited engineering schools and offers to make a professional presentation on some current topic of engineering interest such as ocean engineering, pollution abatement, nuclear engineering, etc.

These presentations are usually made at a meeting of the local student engineering societies. In cases where the universities are far removed from the location of the EFD, area ROICC/AROICCs are tasked with making these presentations. This formula has proven very successful in that college studetns are exposed to what the navy is doing in the various engineering fields.

In addition to the technical presentations, the College Program is also used as an avenue for providing information relative to the CEC to NROTC units. This has been accomplished by utilizing a new movie about the CEC and showing it to interested NROTC engineering students at the schools visited.

The College Program is moving full speed ahead, but CEC officers who are interested in becoming a part of this active community-oriented program are always welcome to participate. For further information, please contact the following College Program Officers: Headquarters Coordinator, Lt. Ed Lowery, Autovon 224-2929; NORTHDIV, LCdr. Bill Harmon, Autovon 443-3953; LANTDIV, Lt. Ernie Taylor, Autovon 690-7531; SOUTHDIV, LCdr. Don Naegele, Autovon 794-4811; CHESDIV, Lt. Dick Siler, Autovon 288-2488; WESTDIV (including PACDIV area), Lt. Larry Givens, Autovon 859-2901.

Personal Pride Pays Off

By JOHN PETERSON

Special Assistant
To The Public Works Officer CBC

• Port Hueneme, Calif.

Lawn and landscape planting care at the Construction Battalion Center, Port Hueneme, Calif. have been improved to a marked degree through the simple expedient of assigning designated grounds areas to individual gardeners.

The gardener thereby acquires a sense of responsibility, with the knowledge that this designated area becomes *his and his alone* to be kept.

If it is spruced up, the credit is his. If it is unkempt, the censure is his. The gardener knows that his designated area will be inspected by all interested parties, including his own departmental supervisors.

He is no longer a nonentity, a member of a mass group. He becomes an individual, with the privilege to exercise his personal pride and by so doing to have his accomplishment recognized.

If his area is judged the best kept up on the center, recognition for his accomplishment in the form of a letter for his personnel jacket as "Gardener of the Month" will be received. His picture will be posted in Public Works headquarters and will also appear in the biweekly CBC newspaper, "Coverall".

The assigned gardener performs all the work in his area except for large area lawn mowing and large quantity brush pick up.

Prior to September 1972 the ground crew consisted of 1 shop head, 2 roving gang-mower operators, 5 assigned gardeners and 13 roving gardeners.

During September, the 13 roving gardeners were assigned to individual areas. Three months of operation under this change reveal advantages as follows:

a. A noticeable improvement in the appearance throughout the entire Center.

b. An improved work production. The roving crew had been less productive, had high travel time and was incapable of covering all the areas. The assigned gardeners are highly productive, do not lose travel time and all areas are now covered.

c. Improved employee morale.

Historical

The Yards and Docks Annex

By LESLIE WALKER

During most of the Second World War, the headquarters of the Bureau of Yards and Docks occupied 145,000 square feet of space in the Main Navy Department Building on Constitution Avenue in Washington, D. C. It also occupied an additional 16,000 square feet of space in two nearby temporary frame buildings. Because of the rapid expansion of the navy, the Main Navy Building had become greatly overcrowded by the end of 1944, and additional space was needed for the Bureau of Ships and the Bureau of Ordnance.

In the middle of January 1945, Under Secretary of the Navy Ralph Bard appointed a board to study the problem. The board decided that the Bureau of Yards and Docks should relinquish its space in the Main Navy Building to the Bureau of Ships and the Bureau of Ordnance, and supposed that the headquarters of the Bureau of Yards and Docks would be dispersed in several buildings throughout the greater Washington area.

However, Vice Admiral Ben Moreell, Chief of the Bureau, did not want his headquarters to be fragmented. He felt that the bureau should be kept intact in one location, because its functions were too closely knit to permit any further separations that would decrease efficiency. Therefore, on 29 January 1945, Admiral Moreell strongly recommended to the Under Secretary that when the bureau vacated the Main Navy Building it should be permitted to consolidate all of its actiivties in one building. The Under Secretary approved this recommendation, and he also gave the bureau permission to select a site and construct a temporary building on it.

On 26 February 1945, the War Department and the Public Buildings Administration approved the bureau's selection of a ten-acre site across the Potomac River at Arlington Farms in Virginia. This site adjoins the Arlington National Cemetery near the Memorial Bridge, and now comprises a portion of the South Post of Fort Myer.

Anticipating the approval, the civil engineers of the bureau wasted no time. On 24 February 1945, an order to proceed had already been giveen to the selected contractor, John McShain, Inc. Construction started immediately, although a firm contract was not signed until May 1945. The original plans scheduled a completion date of 1 July 1945 for the new Yards and Docks Annex, as it was officially named.

The bureau had hoped to move into its new home during June 1945, but inclement weather and a strike of the contractor's employees forced an extension of the official completion date to 15 October 1945. Meanwhile, the bureau's staff of 1,800 persons actually moved into the new, but not quite completed, building during the week of 8 through 15 July 1945.

The move was not without its humorous aspects. In the absence of Admiral Moreell, who was away on official business at Davisville, Rhode Island, Rear Admiral Lewis B. Combs, the deputy chief, was in charge of the bureau. While he was still in the Main Navy Building, his secretary had deserted to the new building. Surrounded by mounds of packing cases, he manned the telephones, typed a few memorandums, and otherwise conducted the bureau's business without secretarial assistance.

The Yards and Docks Annex served as the headquarters of the bureau until April 1973. The intervening period was not without its numerous alarms. Throughout the period, the bureau, and the successor Naval Facilities Engineering Command, on numerous occasions was scheduled to move from the "temporary" headquarters to allow expansion of the Arlington National Cemetery. On each occasion, for one reason or another, a reprieve was granted. By the end of 1972, the reprieves finally ran out, and the headquarters of the command was irrevocably given the word to vacate the Yards and Docks Annex. The command is now in the process of moving its headquarters to a new office building in Alexandria, Virginia, designated as Hoffman II. April 1973 will end almost 28 eventful and glorious years of occupancy of the annex.

Advice of Counsel

Effects of Noncompliance

"The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law."
Justice Holmes.

• Alexandria, Va.

Federal Government procurement actions are subject to a host of legal requirements from many levels. Where the action is not in full compliance, what will be the consequence to the validity of the action?

Procurement statutes and regulations rarely state the effect of noncompliance. When they do, they often indicate no effect — by stating that the administrative action is final and conclusive or may be set aside only if arbitrary or capricious, not supported by evidence, or beyond rights, or by providing criminal penalties that arguably preclude other effects.

Such express statements may be necessary since the classic view holds actions contrary to law to be null and void. Government procuring officers in theory can bind the government only by actions strictly in accord with all legal requirements.

The hardship of invalidity upon both outside parties and the government is apparent, since requirements are so numerous, imprecise, and subject to different determination, that most actions could probably be found somewhere by some reviewing authority to be non-complying. In a recent case, whether the low bidder was small business had been decided by the Small Business Size Appeal Board, a district court, and a Court of Appeals, each reversing the lower; and the Court of Claims held that award made following the district court's decision was not null and void but should be terminated for convenience. Even on a contract declared void, the contractor may be entitled to *quantum meruit* compensation for work performed to benefit the government. The courts and the Comptroller General hold contracts void only when the illegality is plain and palpable, and, perhaps, also, when caused by actions or statements of the contractor himself.

Another consequence may be that the action is given effect as it legally should have been, by incorporating clauses in the contract or interpreting the contract as it should have been written. The Court of Claims denied anticipatory profits on the basis of termination for convenience principles not stated in the contract, and exculpatory clauses are frequently interpreted out of existence.

Illegality may have no effect because complainants did not protest soon enough or because requirements were not for their benefit and they have no standing. Thus, illegality may have a great variety of effects.

Career Professionals To Get By-Name Distribution Of NCE

By LTJG C. J. FEHLIG, CEC, U S N

Public Affairs Officer
Headquarters, NAVFAC

To provide for a wider exposure of significant NAVFAC programs, milestones, and progress, distribution of *The Navy Civil Engineer* is being expanded to include all NAVFAC career professional civilians performing *in Fleet and Headquarters Command Staff functions and at Public Works Departments at non-NAVFAC activities.*

All personnel in the engineer, scientist, administrative, managerial and other professional GS rating series, and those persons who by nature of their work would benefit from the magazine, would appropriately qualify to receive the magazine.

***The Navy Civil Engineer* magazine serves as a medium for the communication of professional information within the Naval Facilities Engineering Command family and for the exchange of information concerning new techniques and improved methods in engineering, construction and related functions of NAVFAC. It is the intent of the magazine, therefore, to reach all employees who would benefit from exposure to a periodical which communicates professional information concerning the various tasks of NAVFAC and through this exposure obtain a beneficial cross fertilization of ideas.**

If *you* want to receive the NCE please take a few minutes to complete the form below and mail it to the Editor, *Navy Civil Engineer* magazine. WE WANT YOUR READERSHIP!

If you are a Federal Civil Service employee at a public works *department* of an installation *other* than those of the Naval Facilities Engineering Command or assigned to fleet and headquarters command staff functions, or other activities normally staffed with Civil Engineer Corps officers you may obtain your personal subscription to *The Navy Civil Engineer* by completing the form below:

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_____

Authentication may be made by a Civil Engineer Corps officer on active duty, preferably at the office, to which the employee is assigned.

Mail to: **The Editor**
NAVY CIVIL ENGINEER
Code 22M, NMBC
Port Hueneme, Calif. 93043

HOFFMAN II, of the Hoffman Complex, now houses Headquarters, Naval Facilities Engineering Command together with other Department of Defense agencies. Hoffman II is located at 200 Stovall Street, Alexandria, Va. 22332

new quarters for HEADQUARTERS Naval Facilities Engineering Command

Completing a 28-year occupancy of the site adjoining Arlington National Cemetery (see page 30) the Headquarters of the Naval Facilities Engineering Command has been relocated to nearby Alexandria, Va., within the newly constructed Hoffman Complex, a privately owned facility.

Consisting of two structures, Hoffman I and Hoffman II, the complex is totally occupied by Department of Defense agencies.

Headquarters, Naval Facilities Engineering Command occupies the ninth through twelfth floors of Hoffman II, located immediately adjacent to Interstate Route 495.

Readers of *The Navy Civil Engineer* are requested to note the change of address:

Headquarters
Naval Facilities Engineering Command
200 Stovall Str.
Alexandria, Va., 22332
Information Tel: AC 703/325-7319
Autovon 221-7319

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